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A white Lincoln MKC is shown from a side profile, driving on a road. The car is positioned in the lower half of the frame. Above the car, a large concrete bridge structure arches over the road. The background features a green landscape and a cloudy sky. The word "FORMIDABLE" is overlaid in large, white, sans-serif capital letters across the middle of the image, partially obscuring the car and the bridge.

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THE EXCLUSIVE
GLICKENHAUS
SCG003

Sixties supercars blurred street and circuit. Jim Glickenhaus's new \$2.4M creation pays homage.

BY LARRY WEBSTER

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Lighter, smaller, stronger: The Miata is better than ever.

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DEATH OF
A PISTON

For Mazda, three seasons of racing development all began with a single melted engine component.

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How a Japanese roadster became the most popular race car in America.

BY JACK BARUTH

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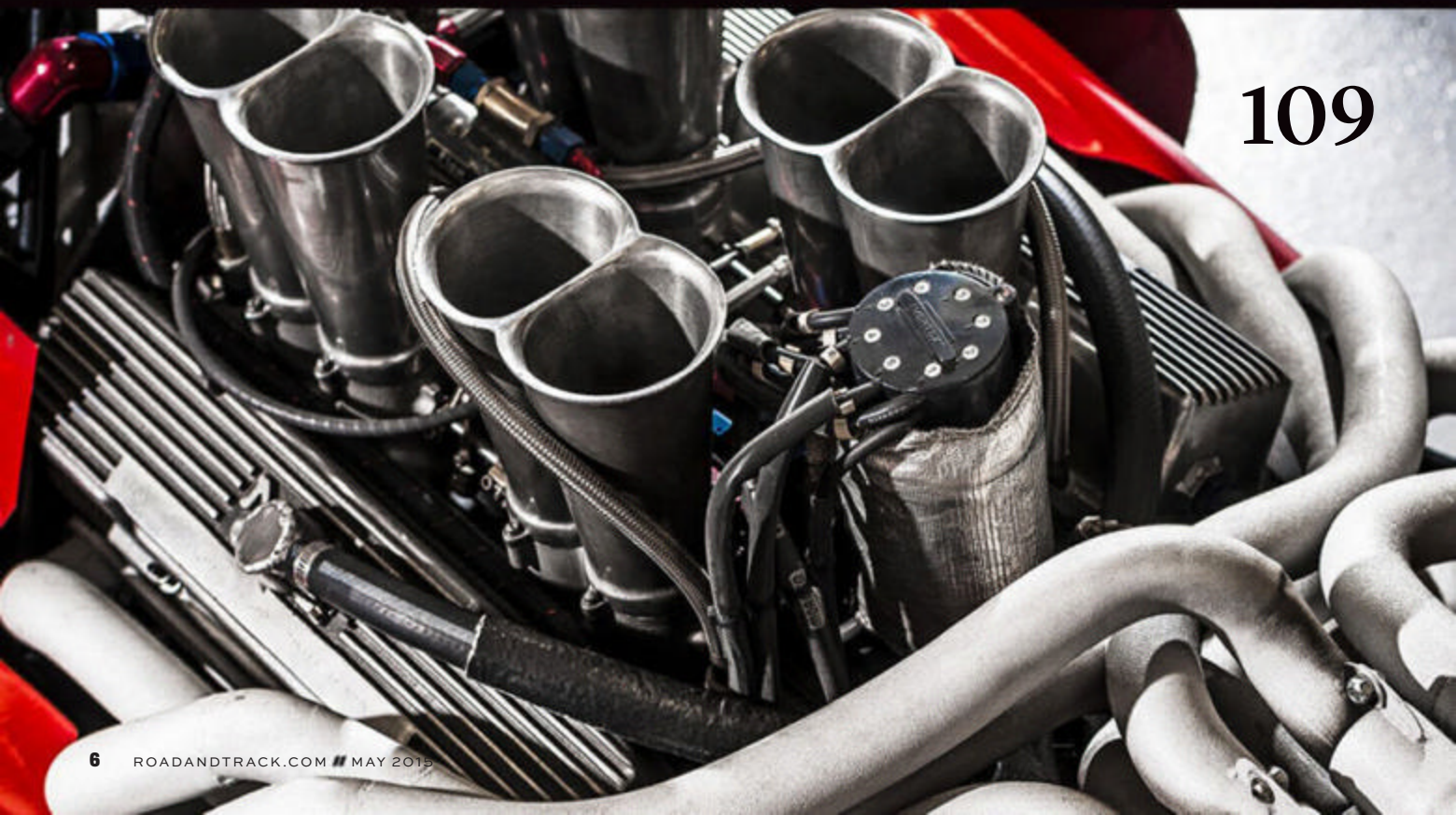
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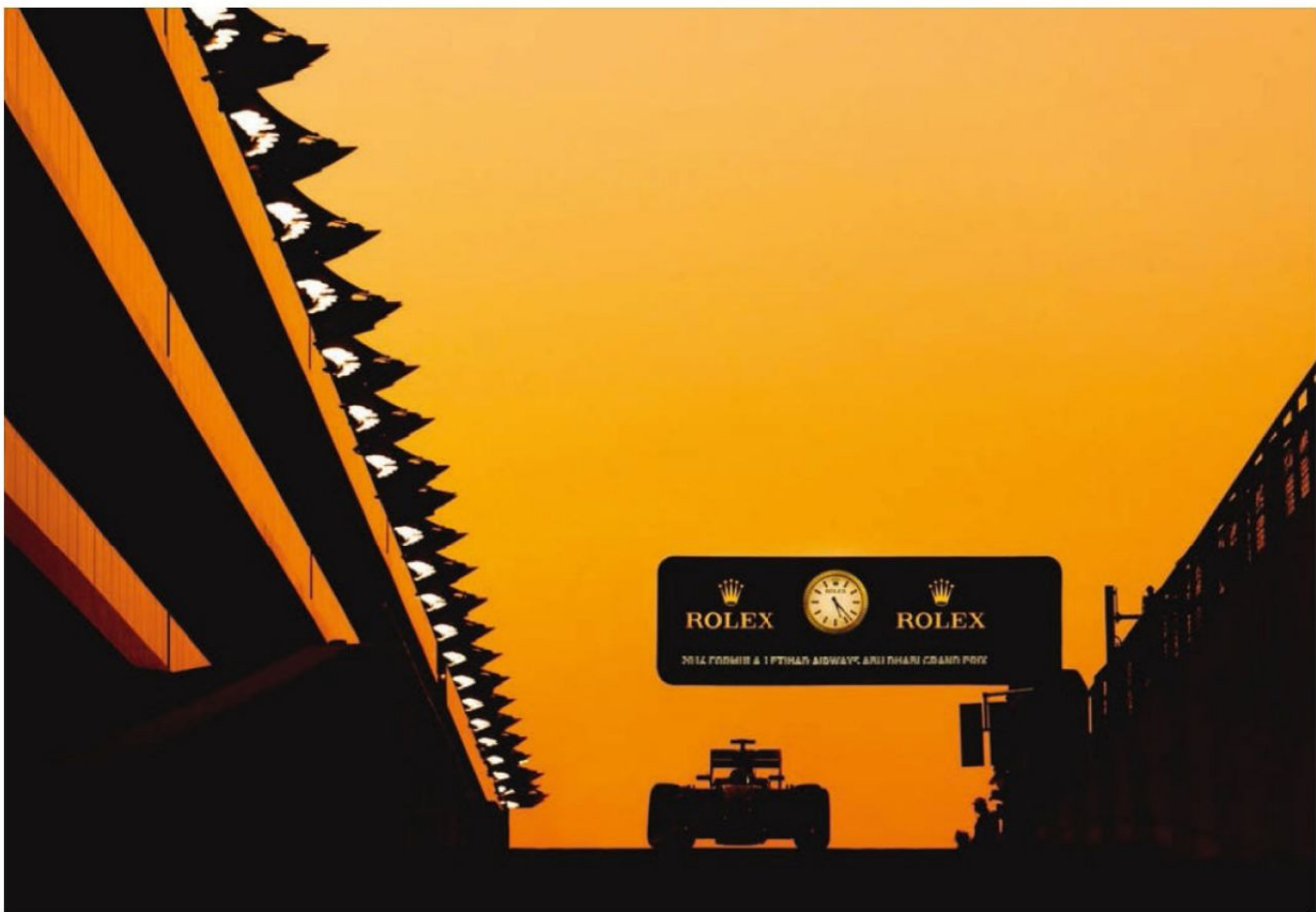
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Michael Caruso interviews George Fury.

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Letters

THE 911 GT3 IS OUR PERFORMANCE CAR OF THE YEAR. THE GREMLIN IS NOT.

Dear R&T,

In your Performance Car of the Year test [December 2014/January 2015], the Porsche 911 GT3 is the only car with an 11-second quarter-mile using six cylinders, less than four liters, and no forced induction. Its acceleration nearly matches the Nissan GT-R Nismo, which has the advantage of all-wheel drive and an extra 125 horses. Oh, and the GT3 is 0.3 second off the Motown Mile lap record.

ALEX RANARIVELO, SANTA MONICA, CALIFORNIA

Correct on all accounts, Mr. Ranarivelo. Almost seems like we should give the GT3 some kind of award, huh?

PCOTY, CONTINUED

I just received my winter issue with "Performance Car of the Year" emblazoned across the front and decided not to crack it open. Why? Well, I see a Porsche on the cover, and you jackasses think the sun rises and sets there.

JIM HALL
DOUGLASVILLE, GEORGIA

This year's PCOTY article was great. Jack Baruth really hit the nail on the head describing the different cars, the sounds, the feel, the bumps in the road. I read the story not knowing the outcome and became totally involved in the process.

MARC HOHENSTEIN
NEW YORK, NEW YORK

I really enjoyed the PCOTY article. And, for your pilot readers, the Motown Mile: From the cargo area at Detroit City Airport, make a left turn on Juliet, cross Runway 7, right turn on Hotel, right turn on Lima, cleared for high-speed taxi Runway 7, left turn on Mike, right turn on Hotel, right turn on Golf, cross Runway 7, right turn on Juliet, left turn into the cargo area, and standby. Or repeat.

LAWRENCE MURDTER
SUNNYVALE, CALIFORNIA

The Jaguar F-type R Coupe is beautiful, exciting, and worthy of the marque, but I can't forgive its porcine mass compared with the other PCOTY entrants'. How can an aluminum-intensive two-seater outweigh the bigger, cheaper Mustang and Camaro? It's even heavier than the larger, all-wheel-drive Nissan GT-R Nismo. What went wrong? If Jag is serious about besting Porsche, it will have to do a lot better on weight control.

GRANVILLE POOL
REDWOOD VALLEY, CALIFORNIA



The curb weight of the 2015 Mustang GT in your PCOTY test is some 100 pounds more than Ford's official figure. Are you quoting the manufacturer's claimed weight or using your own scales? If you're weighing them yourself, is gasoline included? This is getting more confusing than the search for Amelia Earhart.

GREGORY FEY
WESTLAKE VILLAGE, CALIFORNIA



We do indeed use our own scales. Automakers often report a "dry" weight (no coolant, oil, etc.), but R&T weighs cars "wet." That means our official figure accounts for all fluids, including a full tank of fuel, just as you'd find the cars on dealer lots. So the Mustang GT weighs 3806 pounds. Give Amelia our best.

Are you all on controlled substances? A PCOTY shootout without the awesome Corvette Z06? And with the lame excuse that it wasn't ready yet? Then wait! Wait a year if you must, but a PCOTY test without the new Z06 is like holding a Miss World Music without Beyoncé! Get real, guys.

KENNETH GUTWEIN
GLEN COVE, NEW YORK

The Z06 will be in this year's PCOTY competition, where it belongs, next to the best performance cars released in 2015. Our buzz will wear off by then.

So for the PCOTY you picked . . . the second-best car? Maybe you're right: No genuine sports-car fan would want to drive that Ferrari 458 Speciale. It must be, as you say, so uncomfortable.

JOHN PUCCIO
MARTINEZ, CALIFORNIA

I could've missed it in the text (smudges of drool will do that, I've found), but why does the 911 GT3 do 0 to 60 mph

CONTINUED ON PAGE 12 ►



EDITOR'S LETTER BY LARRY WEBSTER

THE LAST TIME I CRIED, I was at a racetrack. I had crashed, and it was entirely my fault. The car that held untold hours of labor—and far more money than was prudent—was mangled. There would be no satisfaction of a fastest lap or a perfectly driven corner. Instead, I watched steam spurt from the busted radiator and imagined it was the vaporized hope, desire, and joy I had experienced with that machine.

That drama is the beauty and the curse of racing. It's life's incredible highs and deep lows played out at high speed in a mostly safe box. The day I stuffed my car, the intensity of my failure was nearly overwhelming. But I also welcomed it, as strange as that might sound. Because, hey, it was a conscious choice with mitigated consequences. My wife and kids back home were fine. I still had a job and my health. And I had left the couch to spend the day hanging with friends and competing with rivals (who happen to be the same group of guys).

Some racers risk more and others spend less, but everyone is there for the same reason: passion. Tracks are hard, loud, inhospitable places, always too hot or too cold, and the food is terrible. Nobody shows up unless he or she wants to be there. That goes for the pros, too: I've long maintained that no one in the racing industry is there just to pay the bills. On the circuit or in the stands, racing breeds a devotion and camaraderie that's rare today.

For this reason, and because motorsport is the lens through which we understand the bleeding edge of possibilities both mechanical and human, we're celebrating the pursuit of the checkered flag throughout these pages. *Road & Track* has a deep history with racing, but this is our first dedicated Motorsport Issue. The timing couldn't be better. A lot has been made about the sport's

Modern racing is more vibrant, competitive, and flat-out thrilling than it's been in decades.

declining fan base, but the truth is that modern racing is more vibrant, competitive, and flat-out thrilling than it's been in decades. How else do you

explain Nissan's insane, boundary-destroying new Le Mans Prototype car (page 64) or Jim Glickenhaus's solitary battle to make an ultramodern and competitive race car that harks back to the era of the gentleman racer (page 40)? From pit lane at Daytona to the seven-figure sheetmetal at the Monterey Motorsports Reunion, each of the stories in this issue reminded me that there's nothing quite like the thrill of the hunt.

As always, we've attempted to capture the joy and excitement of the life lived through cars. We hope you're as surprised and inspired by the human element behind these racing stories as we were while assembling the issue. And if it moves you to finally watch a race in person or take your own car to a circuit, all the better. You probably won't leave crying, but there's no way you'll leave unchanged. ■

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Letters CONT.

in 3.1 seconds but 5 to 60 mph in 3.9 seconds? Is the launch control really that good?

JONATHAN TAYLOR
FRIDAY HARBOR, WASHINGTON

Yes.

Lap times are *the* performance measure, and the PCOTY should be the one that gets it done for less. So the winner should've been the Viper.

WARREN PEGRAM
ALAMANCE, NORTH CAROLINA

WATERED AFTER MIDNIGHT

John Krewson's column about the AMC Gremlin ["A Terrible Time"] made me think about the Gremlin I owned while living on Cannon Air Force Base in New Mexico. I arrived in 1980 driving a Chrysler Town & Country—the woody—but pretty soon I wanted something smaller. A fellow down the street had put a For Sale sign on his yellow Gremlin. He said it needed a little work but he only wanted \$50, so I bought it. As it turned out, you could actually start the Gremlin without a key. I drove it for four years and logged a lot of miles (without ever leaving the base) before giving it to a needy airman. But I only used the key when I had a passenger, so that nobody would know how easy it would be to steal.

NICK CIRENESE
STERLING HEIGHTS, MICHIGAN

My only ride in a Gremlin was with a blonde, 19-year-old brick outhouse of a girl named Lisa, who had somehow taken a liking to a 16-year-old introvert with no car (God bless her). Her Gremlin was purple with mag wheels and a Levi's blue-jean interior, complete with the little red tag on the seats. This thing was so ugly, it was kind of cute, like a French bulldog.

TONY SAYRE
LANCASTER, OHIO

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A man with short brown hair is sitting on a metal bench in front of a large window with a grid pattern. He is wearing a grey zip-up hoodie over a white t-shirt, red and grey athletic shorts, and grey Skechers sneakers with black laces. He has large white headphones on his head and is holding a smartphone in his hands. The background shows a cityscape through the window.

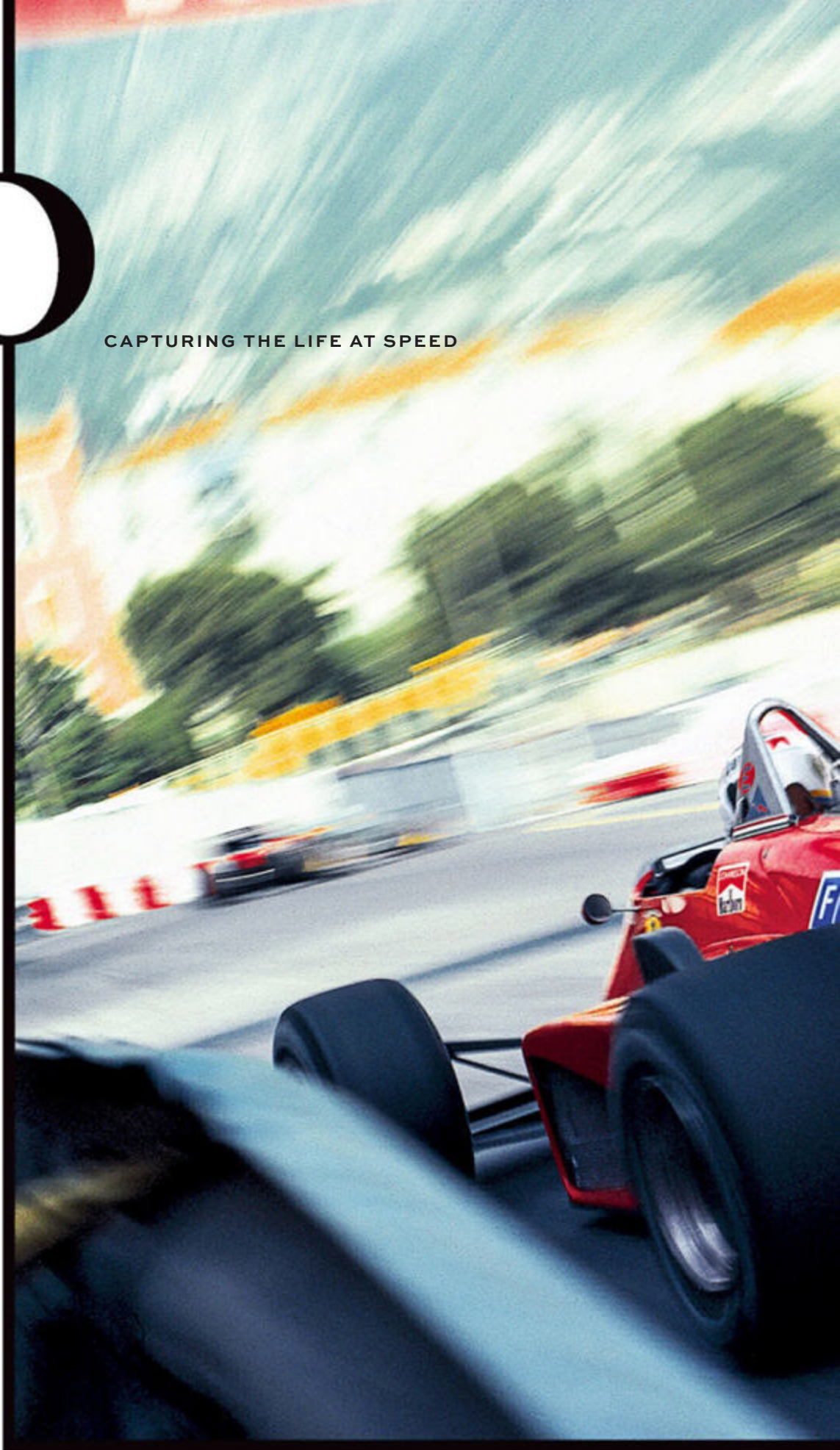
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CAPTURING THE LIFE AT SPEED

Maybe it was your first experience being battered with the percussive, man-made thunder at the Indy 500. Or watching 200-mph land rockets carving through blackness at Le Mans. Or perhaps it was something less glorious but altogether more grand, like strapping yourself into a 20-year-old Miata with a dodgy fuel pump and bashing mirrors at your local asphalt ribbon. Whatever it was, something hooked you—hooked us—on the speed, heartbreak, and glory of motorsport. We've devoted this whole issue to it. These archival images celebrate a few of racing's most unforgettable moments, and some of the biggest names in the sport weigh in on why it remains neither a contest nor a vocation, but a calling. Gentlemen, start your engines.





PASSION

"I thrive on pushing the car and myself to the limit. Winning races is what motivates me to excel. I grew up racing, and it's all I know. I love to drive a race car, and I feel fortunate that I get to make a living doing what I love most."

—BRAD KESELOWSKI, NASCAR DRIVER

FLAMES ERUPT FROM STEFAN JOHANSSON'S TURBO V-6 FERRARI 156/85 DURING THE 1985 MONACO GRAND PRIX.



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"I enjoyed the winning. It wasn't the driving; I didn't have the same affinity and love affair with driving a car. When I won my first race, it was the first thing I realized I was good at . . . and then I won the next one and the next one. The wheel-to-wheel dicing made me smile the most in the last five or 10 years of my career, but ultimately, it was about the winning."—ALLAN McNISH, LE MANS LEGEND

STIRLING MOSS AFTER WINNING THE 1955 BRITISH GRAND PRIX.



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COMPETITION

"The defining moment in my passion for motorsport was racing for the first time on a track. There's a certain feeling that can only be experienced racing wheel-to-wheel, both man and machine at their absolute limits. I've since come to enjoy racing on three levels: as a driver competing on the track, as an engineer appreciating the incredible innovation required for success, and, of course, as a fan."

—RAJ NAIR, GROUP VP OF GLOBAL PRODUCT DEVELOPMENT,
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THE START OF THE 24 HOURS OF LE MANS, 1965.



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THRILLS

"The excitement. Even after 45 years of racing, every time the green flag drops, it's just like your first race. It's the same idea each time, but you never know what's going to happen during that race. It's the excitement of the unknown—and hoping to be better than the next guy." —DAN BINKS, CREW CHIEF, CORVETTE RACING

DRAG RACER TOM "THE MONGOOSE" MCEWEN, 1965.

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DEVELOPMENT

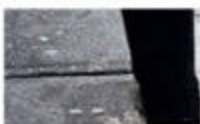
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WALTER RÖHRL AND NAVIGATOR CHRISTIAN GEISDÖRFER MANHANDLE AN AUDI SPORT QUATTRO S1 E2 DURING THE 1985 RALLYE SANREMO.



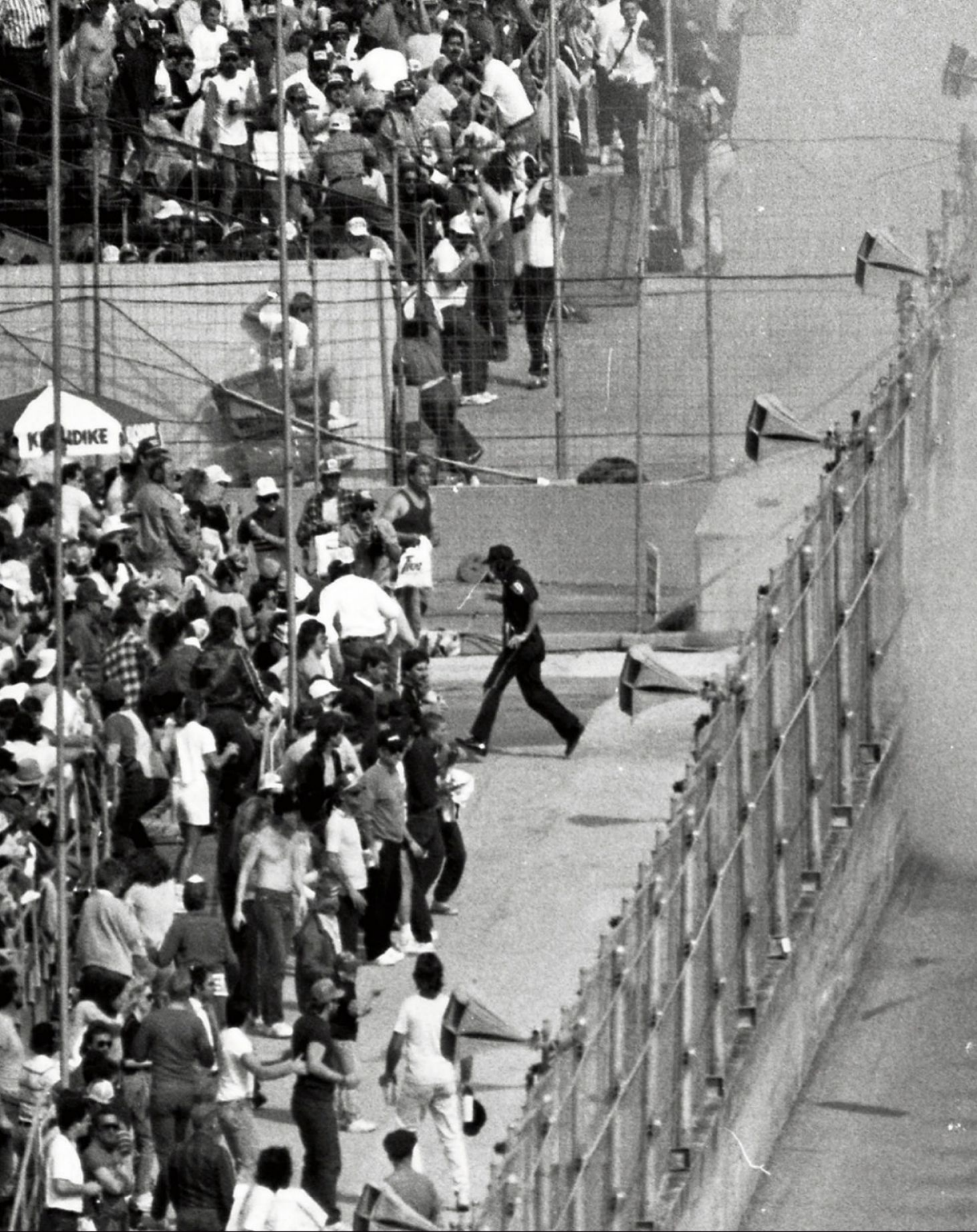


IT IS BETTER TO FAIL IN ORIGINALITY THAN
TO SUCCEED IN IMITATION — *HERMAN MELVILLE*



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EXPERIENCE

"Racing is about the sensory experience. It's sound, it's speed, it's color; it's feel through the vibration of the engine. The longer you're around it, the more you understand it, that sensory feel combined with watching a really skilled driver on the edge of control. It's like Olympic gymnastics combined with a gladiator battle."

—DOUG BOLES, PRESIDENT, INDIANAPOLIS MOTOR SPEEDWAY

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Meet and Greet

DRIVERS, HUMANS, AND THE FEW IN BETWEEN.

SMITHOLOGY BY SAM SMITH

RODE WITH KIMI YESTERDAY. I don't know how many people have said those words, but I assume the number is small and that most of those folks own enormous yachts. Oversize boats, like cocaine or your third greatest-hits album, are a way that God lets you know you're making too much money. And most people do not get to ride around a race-track with a Ferrari F1 driver unless they make too much money.

Kimi Räikkönen. Finnish, 35 years old. A few years ago, at the U.S. Grand Prix, a PR person asked me, "How do you solve a problem like Kimi?" You do not solve Kimi, because he is wonderful. He is a former world champion, for one. He is famously icy and forthright, for another. And while we're on the subject of boats, in 2007, our squire entered a Finnish powerboat race with two friends, each man wearing a gorilla costume. Google it: Finns, wave-jumping, enough fake fur to choke a howitzer. You have to assume the idea was cooked up sober. Or not.

Most pro drivers are too polished. The exceptions, the latter-day James Hunts, are outweighed by the brooding Lewis Hamiltons, the perfect Nico Rosbergs. Thankfully, Gorilla Boat is just one star in the Kimi firmament of unpredictable, human, and deeply excellent acts. We must applaud him, fete him, perhaps erect statues to him in the form of giant apes. I don't know what's appropriate—maybe a gorilla in a crash helmet atop a rearing horse, like *Napoleon Crossing the Alps*. Whatever is standard practice for emperors and Kardashians these days.

When I met the man, at Ferrari's Fiorano test track, it followed an afternoon of *Waiting for Godot* tension. *Will he come? Soon.*

You got the impression he'd been dragged out of bed against his will, maybe with the promise of ice cream at the end of the day.

Perhaps. Maybe. He's late. He's off doing Finnish things. (Hearing that last line, I immediately pictured pony trekking and snogging in an old Volvo, which tells you how much I know about Finland.)

Unlike Godot, he showed. He stood before a crowd of media in rumpled pants and a Ferrari soft shell, hands in his pockets. He gave a series of awkward half-smiles for photos, trying but obviously uncomfortable. The way he was shepherded around, you got the impression he'd been dragged out of bed against his will, maybe with the promise of ice cream at the end of the day. At one point, I caught him rubbing an eye with a balled-up hand, like my 18-month-old daughter after a nap.

We were at Fiorano for a daylong clinic on the F12berlinetta. Customers had complained that the 730-hp F12 was too fast—gasp!—for the road and homicidal on the track, so Ferrari gave journalists data-logged lapping and instruction from factory test driver Raffaele de Simone in an attempt to prove otherwise. Also, it was raining. (I am no Raffaele de Simone, but the car was a friendly slide-a-roonie. Ferrari customers need to have some grappa and chill out.)

At the end of the day, there were rides with Kimi. It's been said that Ferrari can be too manipulative with its heritage; be that as it may, you stand trackside at Fiorano, next to the farmhouse

The author and some famous guy who never smiles, smiling.



holding Enzo's old office, and you feel everything they want you to. You hear whispers of Lauda and Gilles and Schumacher, flat-twelves and V-12s and bloodthirst. And then you get in.

Dude woke up.

The car changed him. He was alive, smirking, beating the thing like it owed him money. It wasn't just sideways—it was aggro, a rally driver's commitment and surgical hand movements coupled with a screw-the-car abandon rarely seen outside trailer parks. At one point, after a 110-mph drift that ended with two wheels nipping the grass, I looked over.

"Is that all? Is there more crazy?"

"I guess?" he said, shrugging. And then he went nuttier. The car grew wings, caught fire, flew to the moon. I laughed and clapped, unable to contain myself. He smiled. He isn't known for smiling. I wish we had a hundred more like him. ■

Sam Smith is an editor at large for R&T. His second greatest-hits album is forthcoming.

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F1rst World Problems

THE GREATEST RACING ON EARTH,
JUST NOT WHERE YOU'D THINK.

PADDOCK PUNDIT BY MARSHALL PRUETT

I'VE SPENT MOST OF MY ADULT LIFE looking to Formula 1 for tech things innovative and buzzworthy. The mind-bending designs of Gordon Murray and Adrian Newey spawned teenage fantasies of moving to Europe and training to become an aerodynamicist. But in recent years, my inner compass has pointed away from Monaco.

For techno-geeks, motor racing has a new address, and it isn't on F1 honcho Bernie Ecclestone's yacht at Monte Carlo. It's pressed up against a fence at Le Mans or at Circuit of the Americas or at one of the six other playgrounds on the World Endurance Championship (WEC) calendar. The coolest cars in motorsport—the seemingly LSD-fueled creations we'll look back on in amazement 20 years from now—are racing in the WEC's top LMP1-Hybrid class, where a liberal rulebook serves as almighty inspiration for those who thrive on creative expression.

The WEC has come up with the closest thing to the glory days of Can-Am and IMSA GTP racing, where a car's height, length, and width served as the most pressing limitations. Barring a few no-go zones, manufacturers are left to fill that cube with their radical versions of four-wheeled hell and fury. Consider the options: In P1, Audi's stump-pulling, 4.0-liter turbo-diesel V-6 battles Porsche's bizarre, 2.0-liter single-turbo V-4, but also Toyota's ornate, naturally aspirated, 3.7-liter V-8, and a shrink-wrapped 3.0-liter twin-turbo V-6 from newcomer Nissan. Toyota's supercapacitor energy-recovery system (ERS) combines with its V-8 to put nearly 1000 hp to the ground on deployment, while Porsche uses two forms of ERS—turbo-fed and flywheel-based—to propel its lightweight challenger.

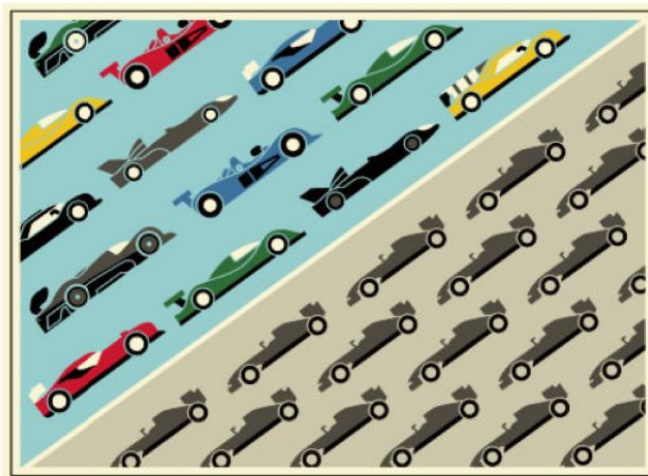
I can't help but wonder if a kid building a Soap Box Derby car has more latitude for expression than his grand-prix counterparts.

To win Le Mans last year, Audi went the traditional route: It championed the internal-combustion engine and used the smallest amount of ERS power possible. To compete in 2015, Nissan originally targeted the moon and tried to harvest the maximum from its mechanical ERS, settling on a total output of 1250 hp. That Nissan, which is covered in more detail on page 64, is also front-engined and front-wheel-drive. Its rivals are mid-engined and make use of all-wheel drive through ERSs routed to the front tires while the old-school engine roasts the rears.

This kind of insanity takes money, and lots of it. Manufacturers are committing F1-level budgets on a lesser-known series

like the WEC because they can play on their own terms there, go into battle with their own technology, and keep a (mostly) straight face when they say that some of what they've learned in LMP1 will trickle into future road cars.

In Formula 1, the opposite is true. Ferrari, McLaren, Williams, and other teams from F1's pantheon of greats have opted into a perverted form of the sport where each constructor builds its version of the same rule-mandated car. Having lived through F1's engineering heights, I can't help but wonder if a kid building a Soap Box Derby car has more latitude for expression than his grand-prix counterparts. It's technical asphyxiation. Fixed



engine specs have F1 manufacturers casting paint-by-number mills with the same 1.6-liter displacement, six cylinders, 24 valves, 90-degree vee, and central exhaust location. Silly maximum fuel-flow rates, instituted as a nod to environmental concerns, and a 15,000-rpm rev limit, far lower than engine speeds of a decade ago, are made worse by bans on teams making substantive improvements to a car over the course of a season. Combine that with restrictive chassis and bodywork dimensions, and you have the once-proud sport of kings reduced to little more than clone wars.

Even Newey, a design legend, recently decided it was time to step away. Maybe he'd grown tired of penning iteration after iteration of the same damn Red Bull F1 chassis. The situation is enough to leave you nostalgic for the days when new F1 cars warranted Zapruder-like analysis, journalists (and other teams!) struggling to grasp the radical concepts unveiled during preseason tests at Estoril or Paul Ricard. F1 teams, which once produced the most inspiring race cars on the planet, ►

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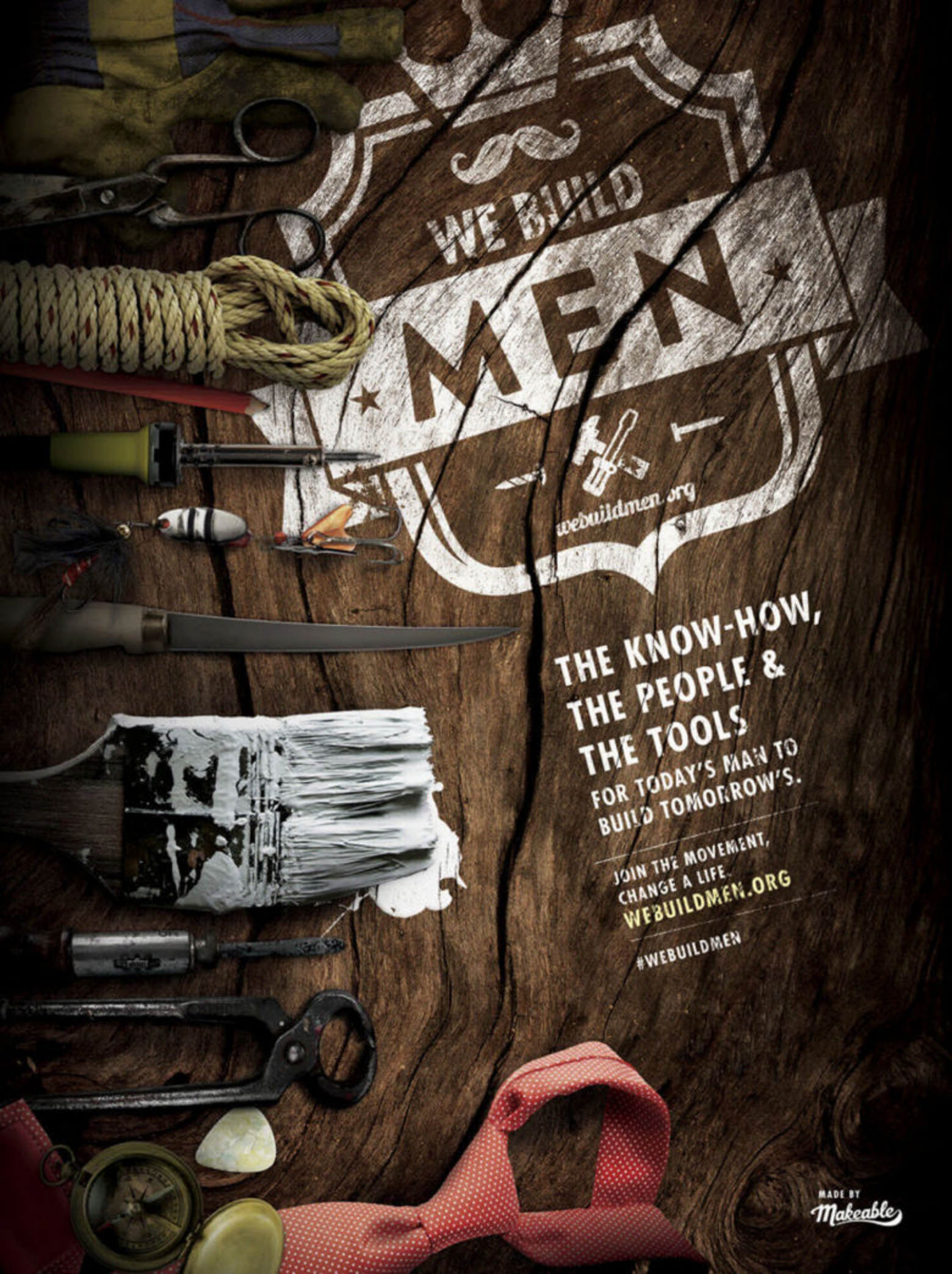


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now hold emergency meetings to look for ways to turn back the clock.

Despite its shortcomings, F1 is still more popular than any other form of racing, but its narrative has definitely changed. The appeal is more basic. As the cars become less rolling laboratory and more appliance, F1's importance has been decoupled from its popularity. In the absence of frightfully fast and inspiring vehicles, the headlines move toward TMZ sensibilities as team-owner rifts and trash-talking teammates litter the news.

I've placed F1 on a personal, semi-permanent time-out, and until it comes up with a better formula, I'll continue to find salvation in the Democratic Republic of Le Mans Prototypes. And I'm not alone. Discerning fans and a growing portion of the auto industry have also turned their interest to the home of endurance racing. Aston Martin, GM (through Corvette), and Porsche all fund massive programs to compete for GTE-class honors. Ford's due to join the party in 2016, the 50th anniversary of its first Le Mans win, with its revived GT.

WEC drivers are for the most part relatively unknown, but the cars they wield are unforgettable. The world's biggest stars race in F1, and the global awareness it offers manufacturers and sponsors is unparalleled. F1 dwarfs the WEC in almost every metric worth measuring, which makes the WEC's recent explosion in popularity—and the growth from two LMP1 manufacturers in 2013 to four in 2015—a rather fascinating development. F1 will find its way out of the wilderness at some point, and when it does, the cars will earn their fair share of the spotlight. Until then, we have LMP1 to remind us that, while drivers come and go, the cars are the real stars. ■

Former race engineer and R&T contributing editor Marshall Pruett still prefers bias-ply tires.



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THE THROWBACK

JIM GLICKENHAUS WANTED A RACE CAR HE COULD DRIVE HOME.
NO ONE SELLS THEM ANYMORE, SO HE BUILT HIS OWN.

BY LARRY WEBSTER | PHOTOGRAPHY BY TOM SALT

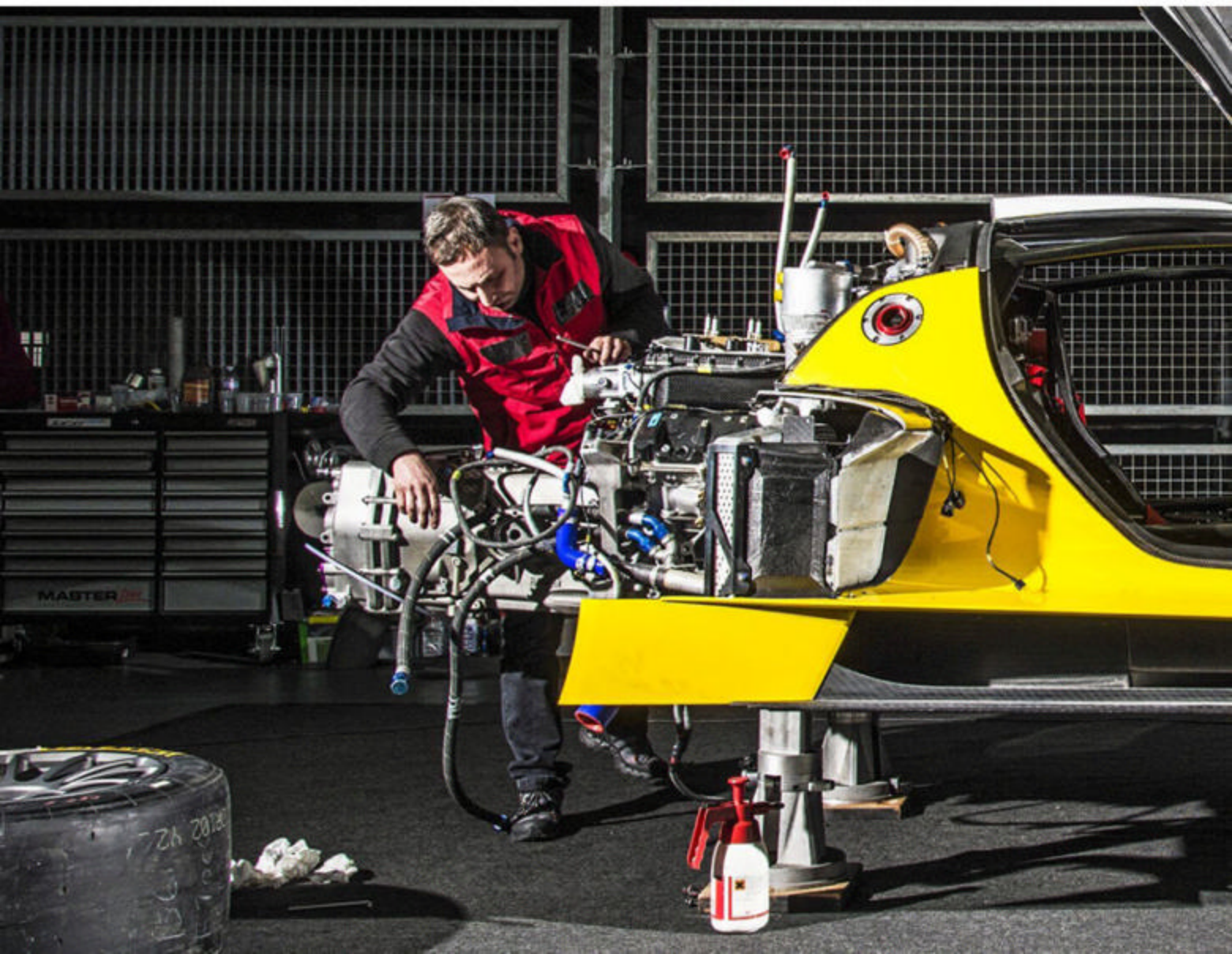
THE ENGINE ARRIVED AT 10 O'CLOCK on a Saturday morning in a plain white Fiat van. The exhausted driver, dressed in gray sweatpants and a dingy brown vest, slid open the side door with a vacant stare. He had driven through the night, ferrying the motor from Turin, Italy, some 700 miles to MotorLand Aragón, a racetrack in north-eastern Spain, so the team could continue testing the new car.

Forklift arms slid under the pallet that carried the engine. The operator lifted the cargo and backed it out of the van. The motor rocked on its platform precipitously, until a man wearing a dark Stetson hat sprang forward and steadied it with his hand. The savior in this case was also the instigator, the guy whose ideas and drive had brought all of us—the engineers, the mechanics, the drivers, a photographer, and me—to the otherwise empty racetrack. The guy with the quick hand was New York native Jim Glickenhaus, and the machine waiting for that engine, the Scuderia Cameron Glickenhaus SCG003, is his way of taking on the sports-car establishment.

Glickenhaus, 64, has stout car-guy bona fides. With the proceeds from his family's money-management firm and other business interests, he's amassed an enviable collection of vintage cars that he routinely exercises with uncommon—some would say insane—intensity. (He's driven 40,000 miles in his 1967 Ford GT40 Mk IV that finished fourth at Le Mans, and his 1967 Ferrari 330 P3/4 has more than 20,000 miles on it.)

SIXTIES EXOTICS WEREN'T SIMPLY TO ADVERTISE WEALTH, BUT AUTHENTIC COMPETITION MACHINES.

His personal brand of enthusiasm skews to dual-purpose sports cars of the Sixties, the ones that drifted between track and street with few modifications. To Glickenhaus, that was the golden era of sports-car racing, because Sixties exotics weren't simply vehicles to advertise wealth, but authentic competition machines. "There was very little difference," he says, "between the 289 Cobra that drove on the street and the one that raced."



A decade ago, he commissioned Pininfarina, the Italian design firm behind the lion's share of Ferraris, to build a modern version of his P3/4. Ferrari, a company with an acute control complex, initially shunned the idea, but when then president Luca Cordero di Montezemolo laid eyes on Glickenhaus's gorgeous car, he gave his blessing (surf to p45c.com to see it for yourself). Montezemolo's approval was helpful, since the new car was based on the Ferrari Enzo. Glickenhaus called it the Ferrari P4/5 by Pininfarina. Next, he ordered a racing version of the P4/5 and based it on the Ferrari F430. The so-named P4/5C finished 39th in the 2011 Nürburgring 24-hour race. The following year, Glickenhaus hybridized the car with an energy-recovery system that dropped lap times and netted 12th place.

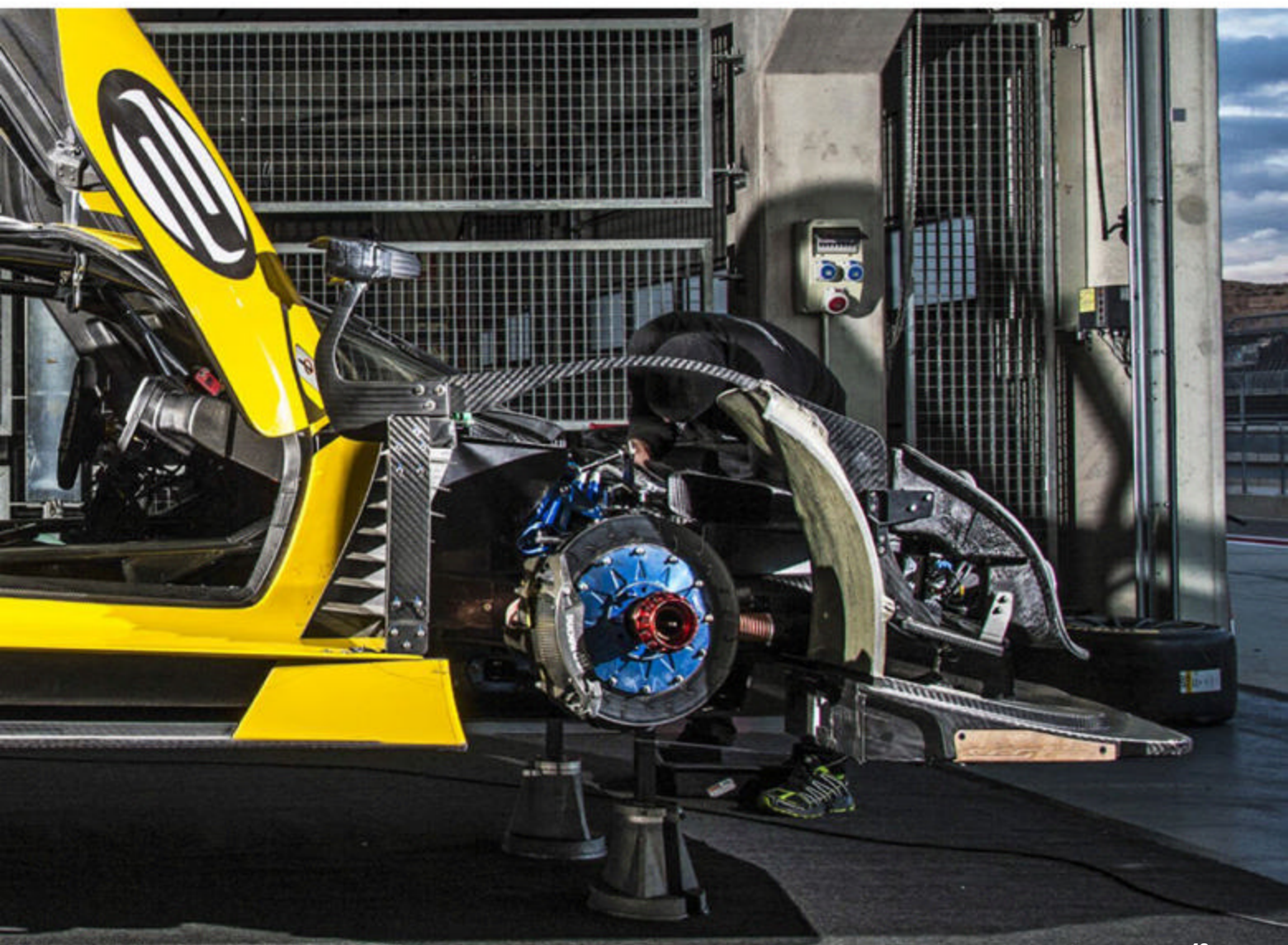
That success under his belt, Glickenhaus hoped to race his hybrid with the big dogs. A trio of hybrid supercars—the Ferrari LaFerrari, the McLaren P1, and the Porsche 918 Spyder—was on the horizon. Alas, none of those companies had plans to run those cars in competition. What to do?

Twin-turbo V-6, carbon-fiber chassis, streetable and raceable. The SCG003C is lust on wheels.

“Let's go back to basics,” Glickenhaus instructed his long-time team leader, Paolo Garella, “and build a real dual-purpose sports car.” That conversation happened a little more than a year before we parachuted into the test session this past February, arriving mere hours after detonation caused by poor fuel knocked a hole in a piston of the SCG003's engine.

GLICKENHAUS POINTS TO THE SERIAL NUMBER—EG03—stamped into the aluminum engine block. That's shorthand for Experimental Glickenhaus number 3. It's a twin-turbo Honda V-6 racing engine built specifically for prototypes that run in the Daytona 24-hour race and the Tudor United SportsCar Championship series. Typically, this engine is leased only to racers, but Glickenhaus convinced Honda to sell him the motors, so he in turn could offer them to his customers.

Yes, customers. He's already sold the yellow SCG003 pictured here to 2014 Ferrari Challenge champion Chris Ruud. There are two SCG003 variants, the SCG003C racing version and the SCG003S road car. (He's built one street version and two racers.) The team has been traversing warm-weather European tracks,





CLOCKWISE FROM LEFT: Fender slats funnel air from wheel well. Jim Glickenhaus looks on. The SCG003 on track.

developing a pair of cars for the Nürburgring 24-hour in May. Run on a combination of the grand-prix circuit and the 12.9-mile Nordschleife, the

German endurance event has emerged as “the toughest race in the world,” says Glickenhaus. No wonder. The thickly forested Nordschleife is known as the Green Hell for the treachery of its blind corners; its flat-out, 180-mph sweepers; and its frequent rain, which abruptly and unpredictably drenches sections of the track.

Fans flood the place for the annual 24-hour race, some 250,000 spectators filling the woods around the circuit. Mercedes, Audi, BMW, and Porsche teams have all won in the past five years. Toyota president Akio Toyoda has raced it in a Lexus LFA. At the Nürburgring, Glickenhaus has discovered his proving ground and an organization that’s willing to field his cars.

Nürburgring race organizers attempt to level the field by restricting engine horsepower and dictating vehicle weights. Therefore, the SCG003C’s 3.5-liter V-6 is detuned with reduced boost pressure, making 510 hp. Racing weight is 1250 kilograms, or 2750 pounds. Blustered by 150 pounds of ballast, the car’s nominal weight is about 2600 pounds, which creates a power-to-weight ratio similar to a Ferrari F12berlinetta.

“WITH A SET OF CRAFTSMAN TOOLS, YOU CAN TAKE IT APART AND FIX IT.”

That engine and the paddle-shifted Hewland six-speed gearbox occupy the rear of a machine that evokes intense race-car lust. SCG003 is aggressive in the right spots, flowing in others. It’s a black hole for your eyes—the more you stare, the more you notice, until you’re entranced and frozen.

“We couldn’t do another pretty car,” comments a smiling Glickenhaus. Instead, they concentrated on aerodynamic efficiency, the ability of the body to develop downforce with as little drag as possible. Yet, even if the focus was function and not aesthetics, SCG003 strikes a balance between brawn and beauty that’s rare in the supercar world. While Pininfarina didn’t design the SCG003, the design and engineering firm that did, Turin-based GranStudio, is populated with Pininfarina alumni. Lowie Vermeersch, one-time Pininfarina design chief, is head. Garella, the project manager, also has Pininfarina roots, having joined the firm in 1992 and most recently run the special projects division.

The talented group constructed the carbon-fiber SCG003 with an eye toward serviceability. “The car is modular,” says Glickenhaus. “If you have a set of Craftsman tools, you can take it apart and fix it. I wanted to make a car that a human being could fix.” The gorgeously milled suspension pieces, for example, have etched labels, and the bodywork has self-aligning

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holes and fasteners. The car even comes with computer drawings for every part, so owners can have them remade should the need arise.

Throughout the 18-month development process, from computer screen to running prototype, Glickenhau never stopped focusing on the concept of a dual-purpose street and race car. Indeed, converting the car from track to street use requires only that you remove the roll cage and the front and rear splitters, then change the tires.

SCG003 meets road-legal requirements. It has the correct lights and mirrors, and the windshield is Gorilla Glass, the same stuff used for phone screens. It won't, however, have airbags or meet emissions requirements, so in the U.S., it will be classified as a homebuilt, like a Caterham. It will cost many times more than a Caterham, of course. Just how much depends on the customer, since everything is negotiable, from spare parts to horsepower—700 hp is not a stretch—to the configuration of the cockpit. But \$2.4 million is the likely starting point.

THE REPLACEMENT ENGINE FIRES FOR THE FIRST TIME at 8 o'clock Saturday night. There's some nervousness among the crew when driver Manuel Lauck goes out onto the track. The previous engine's problem is blamed on bad local gas that apparently didn't deliver the advertised 98-octane. That's the theory, anyway. The fuel is sent for testing, but results will take a few days.

A bit of luck: Two doors down, in an otherwise empty garage, a mechanic finds 20 unopened drums of Shell V-Power racing fuel. A couple of phone calls

Carbon-fiber furniture fills cabin. Center console houses brake-bias knob and, yes, A/C.

traces the treasure to an Audi team and a deal is quickly struck.

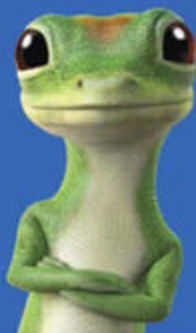
His car now topped off with good fuel, Lauck heads out onto the damp, cold, and dark circuit. After only one lap, he pulls into the pits reporting a misfire. The four engineers, who have spent most of the day sitting and staring at their laptops, spring into action, downloading data and talking among themselves in a mix of English, German, and Italian.

Bosch supplies and programs the car's electronics, from the engine computer to the traction control to the digital dash. The Bosch technician believes there's a fuel-pressure problem that's causing the engine to starve for fuel. The crew cracks a fuel line, hoping to bleed out any trapped air and send Lauck back out. The misfire persists. They let the car cool and again try bleeding the fuel system, but there's a bigger, as yet undiagnosed, problem. At 10 p.m., the track closes and the crew pushes the car back into the garage, promising to have it fixed in time for me to get behind the wheel before I have to leave Sunday afternoon.

At dawn the next day, Glickenhau is in his usual good spirits, even though he stayed with the crew until the wee hours of the morning and has just learned that the engine will again have to



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be removed. There's a problem with one of the tank-mounted fuel pumps, and the only access is with the engine out.

Glickenhaas shrugs and smiles. "It's just amazing that the off-the-shelf, proven part is so often the one that fails." He adds, "But, hey, this is why you test. If we have any hope of finishing the race, we need to find every possible failure."

The crew has patched up the car so I can at least run a few familiarization laps. The maximum engine speed has been reduced to 3500 rpm so the misfire won't occur. There's no telling how much horsepower is on tap, but it won't be nearly the full boat for my drive. Beggars can't be choosy, and all that.

We snap some photos while waiting for the track to dry. Lauck runs a few more "installation laps," and the crew crawls all over the car again. Finally, I climb over the wide sill and lower myself into the bare, carbon-fiber seat of the SCG003. Glickenhaas points to the screens on either side of the steering wheel that display video from rear-facing cameras, and the center console, with its proximity to the driver. "I've taken my 40 years of experience driving exotics and removed the pain," he jokes.

There's legroom to spare for this six-footer and a million-dollar view through the curved windshield. The pavement feels close enough to touch, and the front fenders frame just enough of the view to provide useful reference. A small ceiling console holds a few switches, the ignition key, and the start button. I flip on the ignition and fire the engine.

This instant, when an engine lights, is a glorious moment in the sports-car experience, because it distills all the anticipation that's built up. The Honda V-6 does not waste this opportunity, barking to life and settling into a deep, growling idle. I'm already in love.

The clutch pedal is heavy but is required only to get the car moving. The computer does the rest. The track is still damp as I ease out of the pits, so I take the first few turns gingerly, learning the steering and braking responses.

The brake calipers clamp steel rather than carbon rotors for longevity. The long pedal travel and a corresponding buildup of braking force with pressure remind me of the sublime, easy-to-modulate brakes in the Lotus Evora I used to own.

2015 SCG003C

PRICE \$2,400,000 (EST)
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SEQUENTIAL MANUAL
WEIGHT 2600 LB
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The steering assist, powered by an electrically driven hydraulic pump, is likewise full of feel. Combined, these two controls give the SCG a throwback allure.

The Honda V-6, however, feels like a thoroughly modern turbo engine. There's a whiff of hesitation between the time I bury the gas pedal and when the turbos provide that backside shove, but it's slight. The engine builds its power curve smoothly—at least from what I can tell given the reduced revs. It's a guttural, gloriously menacing lump behind my ears.

I don't come close to seeing the 200 mph the car's good for on MotorLand's long, downhill back straight. Even at my reduced pace, though, the stability is excellent. After a few laps, I pitch the car hard into the corners, trying to find the handling imbalance that often plagues a newly developed car. Either the SCG003 doesn't have one or I'm simply not going fast enough. Quickly coming to the limit of engine rpm, I silently damn the ailing fuel pump that's whirring out of earshot behind me. In most cars with this level of extreme performance, I'm skittish, afraid to push the limit, but I'm quickly comfortable in the SCG. Comfortable enough that I'll forever curse the day I had a smell, but not a taste, of what it feels like unleashed.

There's nothing else to do but pull into pit lane and get out. The mechanics immediately roll the car back into the garage and start taking it apart. I follow along, not sure what to make of Jim Glickenhaus's new car. Yes, it has air-conditioning and enough room for a passenger, so you could argue that it is streetable. But then again, the minimum requirements to make a car street-legal are rather thin. Glickenhaus himself put plates on a Lola T70 Can-Am car. The question is, would you want to drive the SCG003 on public roads?

I know I would. I ask Jim how many buyers he thinks share enough of his passion for the bygone days of the dual-purpose sports car to write him a fat check. "It'd be nice to build 25," he answers, "like Porsche had to do for the 917." He'll use any sales proceeds to continue racing. He has set his sights on the 24 Hours of Spa and the Bathurst 12 Hour race in Australia, plus endurance events in the Middle East. When pressed, he admits hoping to be allowed into the 24 Hours of Daytona.

In the end, it doesn't really matter how many people decide to come along. "Designing and building a race and street car is something I've always wanted to do," Glickenhaus says with a wide smile. "Life is short. We'll see what happens next." ■



THE FIRST DRIVE | 2016 MAZDA MX-5 MIATA

MASTER CLASS

**LIGHTER, SMALLER, STRONGER: THE FOURTH-GENERATION MIATA
RESPECTS ITS PREDECESSORS BUT OWES LITTLE TO THEM.**

BY JACK BARUTH | PHOTOGRAPHY BY STAN PAPIOR & EVAN KLEIN





FIVE LUGS GOOD, four lugs better! When the third-generation MX-5 added a fifth wheel lug to handle its additional weight, increased power, and considerably larger wheels, it was hard for Miata fans not to draw parallels to the ever-increasing size of Elvis Presley's jumpsuit. No longer. The fourth-generation MX-5 returns to four-lug form as part of a Mazda master class in doing what nearly every other manufacturer seems unable to: cut a car's size and weight while improving its crash safety and structural rigidity.

The missing lug saves a few ounces at every corner of the new MX-5. More important, it allows for a smaller wheel bearing, which allows for a smaller control arm, which reduces unsprung weight and allows for lighter suspension components. A holistic approach, building one economy on top of another, is apparent throughout the Miata. The six-speed manual transmission loses about 15 pounds. The differential sheds 22 pounds. An elastic web replaces seat springs, saving 35 pounds. The rollhoops and supporting structure are aluminum. Mazda added three kinds of high-tensile steel in the A-pillars and sills to cut weight and improve crash safety. Think of it as the Malcolm X-5: lighter by any means necessary. In the end, the new MX-5, code-named "ND," is some 220 pounds lighter than its predecessor.

Even the Miata's styling saves weight: The rear corners of the car are chopped off to narrow the bumper beam and support structure. MX-5 designer Masashi Nakayama points out that the standard (and, of course, lightweight) LED headlamps were chosen because they permit a much more compact front end, which further reduces weight and leads to this surprising tidbit: The 2016 MX-5 is shorter than the 1990 original. The fact that the car looks positively vicious compared with any other small roadster in history is just a bonus.

When pressed to name the primary obstacles overcome by

the design and engineering teams, Kiyoshi Fujiwara, Mazda's managing executive officer, chuckled nervously before answering: "Weight, of course—and the business case!" Both objectives were accomplished: The MX-5 is not only light, it's an all-new car engineered during a time when economic caution regarding low-volume vehicles has been the rule, not the exception, among automakers. Mazda's response to questions about the car's financial feasibility is to refer to the slogan "MX-5 Forever," along with the occasional reminder that the company is unique in its 26-year commitment to this segment.

As impressive as the MX-5's crash diet is, the way in which the proportions of the car have been reimagined is arguably more so. The A-pillar has been moved back more than two inches, and the seating position has been lowered by an inch (made possible by a reduced hood height and the aforementioned seat design). The fenders are high and sharp above the wheels, giving the driver the same kind of view enjoyed by anybody who still owns a C3 Corvette.

Beneath those fenders, major changes have been made to improve the MX-5's agility. The wheelbase is shorter, the weight balance is 50/50, and the entire engine sits behind the front axle. That makes it a front-mid-engined car, just like the Viper or an old Panoz LMP racer. In a move straight out of the McLaren playbook, the driver and passenger have been squeezed closer together to reduce the polar moment of inertia. The single cup holder, an outcome of that decision, sits uneasily in the passenger footwell.

The result of all these changes is an MX-5 that respects its predecessors yet owes little to them. That first-gen Miata took styling and conceptual inspiration from the Lotus Elan; this new car is a mini-Viper in proportion and mechanical layout. The second and third generations became bigger to provide more cabin space but grew heavier; this one manages to

wrap around the occupants more tightly yet leave enough room for a six-foot-two driver. It's fearless in styling and execution, wearing its Japanese identity on its sleeve in a way the first three cars never quite did.

Our preview drive day starts with a 30-mile stint in a mechanically flawless 1.6-liter first-generation car. It's refreshing to be confronted again with the original Miata's singular excellence, and it's brave of Mazda to let us drive it right before the new one, but it's also a subtle way to align our expectations for the event, particularly in terms of outright velocity.

The power-retractable hardtop that proved to be popular on the third-generation MX-5 isn't available at launch. However, the soft-top can be



LEFT: The manual folding top is easy to operate from the driver's seat. **OPPOSITE:** Cabin features a center tach and speakers in the headrests. U.S. cars will be left-hand-drive.



operated with a single, low-effort motion, both up and down. In open-air mode, which is surely how most Miatas will be driven, you'll enjoy a fine combination of low belt-line and relatively little cabin turbulence. This is the first new roadster in years where it's not awkward to rest your arm on top of the door, which isn't the kind of feature you'll find on a spec sheet but which makes for a hugely satisfying experience.

Later this spring, we'll have the chance to try the 2.0-liter MX-5 on American soil, but for this Barcelona global preview, we're provided right-hand-drive 1.5-liter models in Japanese specification. The Skyactiv engine is thoroughly revised for longitudinal-mount duty, including equal-length exhaust headers and a steel crank, but with just 129 hp, it's not going to raise any eyebrows at a drag strip. The MX-5's 2200-pound mass allows it to feel slightly quicker than the first-generation car, but we'll have to

wait to drive the 2.0-liter, with its 155 hp, to see how it stacks up when confronted with an American on-ramp and a highly motivated Suburban driver in the other lane.

After two hours on the winding mountain roads above Barcelona, however, it's plain that not even a Euro-fashionable diesel engine could ruin the joy of driving this brilliant roadster. ("There are no plans for a diesel," Mazda told us, "because the additional weight would unbalance the car.") Start with the steering, an unconventional electrically assisted arrangement where the motor is mounted below the rack instead of on the steering shaft.

That increases weight a bit, but it sits lower in the car, so it's worth the trade-off.

The angle of the universal joint connecting the wheel to the rack has also been sharply reduced, for more consistent feel. While the resulting feedback isn't equal to the first-gen car's,

Mazda MX-5 (Japanese spec)

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and the anti-kickback geometry is perhaps a bit too aggressive, there's still plenty of information on hand about available traction. The steering lightens up progressively as the front tires scrub into understeer.

Of which there is less than in pretty much any other production car money can buy. Should this suspension tuning survive its journey to the United States, where the Miata will cost in the mid-\$20,000s, it will be a revelation for the average Miata owner. Even the original Miata wasn't as defiantly neutral as this MX-5—and it turns in with enough bite to step the back out in steady-state cornering. It's enough to make you whoop with joy. Finally: a street car, in factory tuning, that really handles like you want it to and treats its drivers like adults who can be trusted to steer the proper amount in the right direction.

The transmission is so sure and precise that even in right-hand-drive form we never missed a shift or chose a gear we didn't want. Ratios are close, and even sixth will allow the center-mounted tach to buzz past three grand at moderate speeds, but the payoff is steady progress on mountain roads and plenty of chances to run the 1.5-liter up to its very smooth 7500-rpm redline.

We found it impossible to create fade in the brakes—another benefit of relentlessly cutting mass. Engagement into ABS was predictable and manageable. Out of consideration for the cyclists and fellow motorists on these narrow Spanish two-lanes, we didn't step the MX-5's tail out very often, but on a roundabout, it proved to be easy to toss and easy to catch. This is where the consistent steering effort really pays off, because you can get a solid sense of when you've regained the back through your hands. In transitions, such as fast lane changes, the MX-5 is absolutely unflappable once you learn

Less overhang and more aluminum helped the new MX-5 shed 220 pounds and a lug nut.

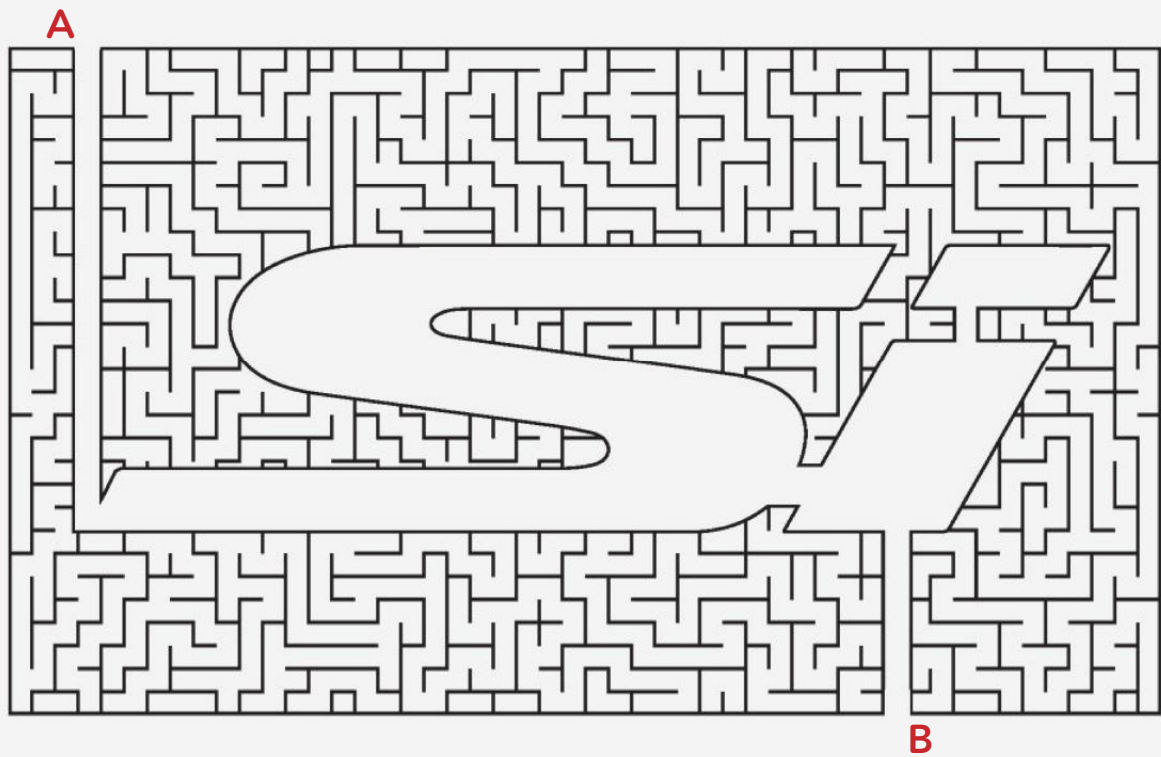
AS A PURE DRIVING PROPOSITION, IT'S SUPERIOR TO NEARLY EVERY OTHER SPORTING VEHICLE ON THE MARKET.

that the front end has very little inertia. You'll get exactly what you ask for through the steering. If you don't like it, try a GTI. It might be shocking for a generation raised on cars with the engine ahead of the front wheels.

The MX-5 is a very fast car on twisty roads. Even the famously enthusiastic Spanish drivers in their hot hatches and entry-luxury sedans might as well be bolted to the ground by comparison. It's deceptively quick: The moment you start griping about lack of grip, you'll notice that the speedometer is indicating perhaps a third more speed than you thought. As a pure driving proposition, the Miata is superior to nearly every other sporting vehicle on the market. You'll become a better driver from learning how to hustle it, because it teaches with subtle feedback in the hands and seat of the pants and it rewards at all speeds.

That said, the extra shove from the 2.0-liter will only improve the felicity with which the MX-5 shreds back roads. There's enough grip here to handle quite a bit more power. The Miata will make a hell of a race car, which is why drivers are lining up to compete in the global MX-5 Cup program.

Is it the best Miata ever? Clearly—but that's like calling *What's Going On* a really great Marvin Gaye record. It's more than a great Miata. It's a wake-up call to the people who build cars around the world, a flag thrust in the faces of those who consider porcine heft business as usual and power-to-weight ratios a problem best solved by hiking both to irresponsible levels. But it's also a wake-up call to drivers. As the purest mass-market car in decades, the new MX-5 is a chance for customers to reward that purity. Were this car half as good as it is, it would be good enough—but instead, it's truly great. They built it; will you come? ■



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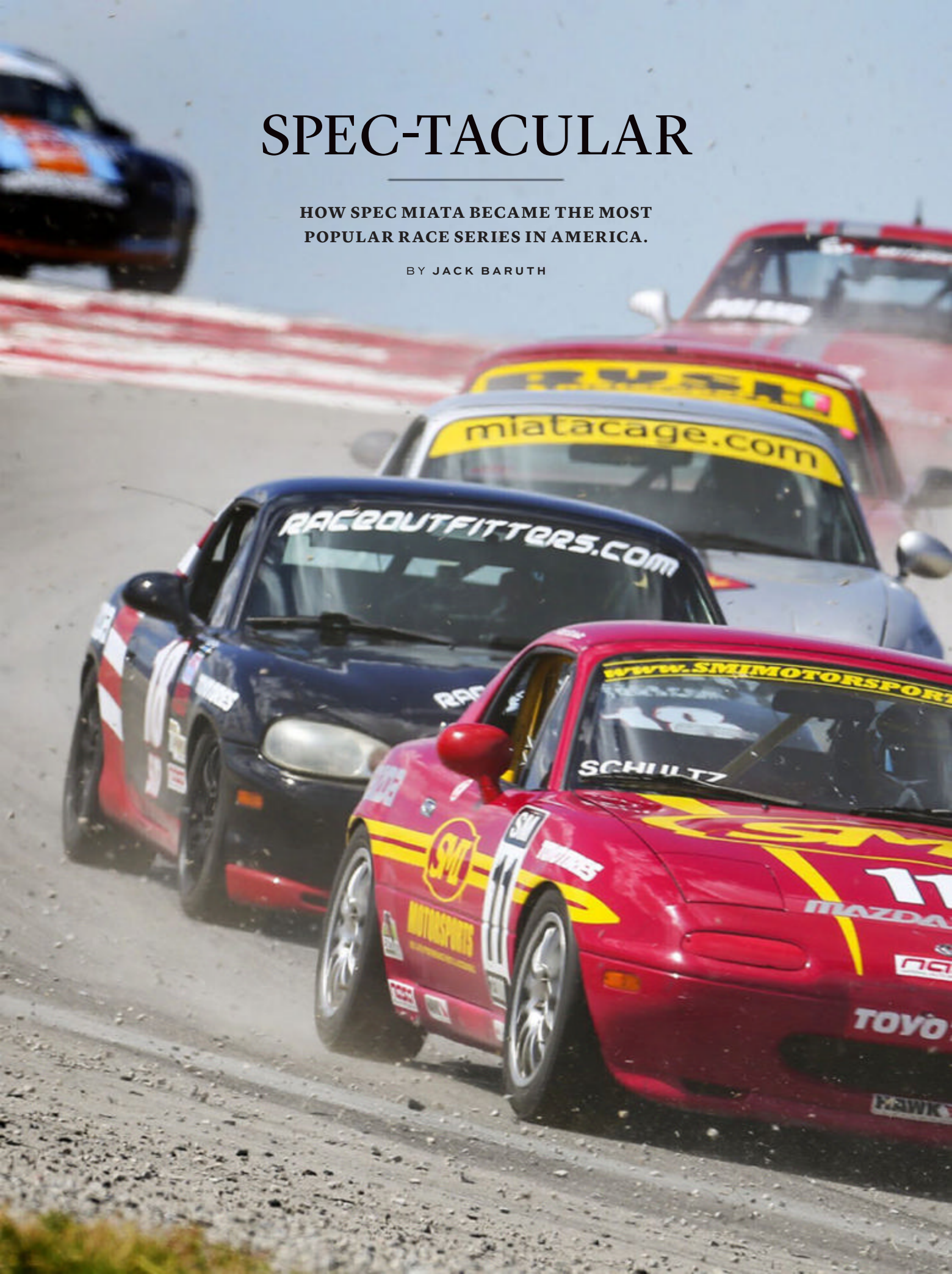


CIVIC *Si*

SPEC-TACULAR

HOW SPEC MIATA BECAME THE MOST
POPULAR RACE SERIES IN AMERICA.

BY JACK BARUTH





WHEN THE U.S. ECONOMY TOOK AN EXTENDED pit stop in 2008, many thought that it would be the end of large-scale amateur road racing in this country. The two major sanctioning bodies—the Sports Car Club of America (SCCA) and the National Auto Sport Association (NASA)—faced the twin threats of skyrocketing operating costs and dwindling entry lists. What arguably saved them was a new and popular form of racing that didn't exist 10 years prior: a spec series based around a set of affordable modifications to the Mazda MX-5 Miata.

Today, Spec Miata is the most popular club-racing class in the country and the largest single class within NASA. Nearly one in six amateur race entries on any given weekend is a first- or second-generation Mazda Miata, and more than 3000 Spec Miata conversion kits have been sold to date. Just as the MG TC was the foundation of amateur racing in the postwar era, its modern, Japanese successor has been the savior of amateur racing today, partly because the buy-in is only about 10 grand. It all seems logical now, but without a few fanatic evangelists, early involvement from Mazda, and some help from airbag-replacement regulations, Spec Miata might not have developed. Of course, not everybody who was there at the beginning agrees on the story.

WHO INVENTED SPEC MIATA?

BOB DOWIE, *Chairman, SCCA Club Racing Board, 2001-2011*: I've always said that if you want to start a fight, a great way to do it would be to ask, "Who invented Spec Miata?" But I think we've agreed that it was Shannon McMasters and David delGenio.

SHANNON McMASTERS, *Co-creator, Spec Miata*: I was a rotary guy from way back. In 1997, I was building cars for the Spec RX-7 class. Mazda wasn't making any money on Spec RX-7 because the cars were at least 10 years old. Meanwhile, there were all these Showroom Stock Miatas that were about to become too old to race in that class.

ROBERT DAVIS, *Senior VP, U.S. Operations, Mazda*: We always knew the car would be raced. In fact, many of the early Miatas were donated to racers for SCCA club racing.

JIM DANIELS, *Founder, Mazdaracers.com and Pro Spec Miata*: We all used to take our old Showroom Stock cars, pull the cages, fix the dents, put the airbags back in, and resell them to the dealers. But then it became a crime to put airbags back in a car without notifying the next buyer, and Mazda didn't want us doing that anymore. So you had race cars with no purpose.

BY RACERS FOR RACERS

McMASTERS: I had an idea. I wrote some basic rules, built four "Spec Racer Miatas," and took them around the country. We'd enter them in another SCCA class as a demonstration.

DANIELS: The Miata just killed everybody in SCCA Showroom Stock racing. But at some point, the car got too old for Showroom Stock and moved to the Production class. And the old guys who were racing the Production classes didn't want

those ex-Showroom Stock Miatas to come in and spoil their party, you know? 'Cause they had three guys

Equally modified Miatas battling at Utah's Miller Motorsports Park in 2013.

**“WE ALWAYS KNEW
THE MIATA WOULD
BE RACED.”**



show up for a race and two of them didn't finish. They didn't want to add 50 Miatas on top of that.

DANIELS: At the SCCA Runoffs in 2000, Robert Davis and Steve Sanders asked me to start promoting the series.

McMASTERS: The Spec Miata kit was stuff they already had on the shelf for other race series. We didn't change much. Looking back, I wish we'd put stiffer springs in, but we used what we had.

DAVIS: I loved the idea, because Spec Miata was a class created by racers for racers.

DANIELS: They sold over 800 kits before the SCCA even started considering letting the Spec Miata have a national championship. Spec Miata took off, but each region had a different idea of how to implement it.

DOWIE: Guys in New England were treating them like Showroom Stock cars. The Texas racers had custom intakes.

McMASTERS: Everybody wanted different tires.

MONEY AND MARKETING

DANIELS: I decided to pay people to settle on a spec, so I founded Pro Spec Miata. We went around the country holding races. There was cash on the line, but you had to run to our spec, not whatever your own region was doing.

McMASTERS: I hated that name, "Spec Miata." At the time, the Miata had a reputation as a girl's car. I wanted "Spec Racer Miata." That earned us a cease and desist letter from the SCCA, which owned the trademark "Spec Racer." But by the time they started trying to get a national championship, I'd dropped out. There wasn't anything I could improve, the spec was settled, and I wanted a new challenge.

JEREMY CROISET, Director of Business Development, NASA: In 1999, we believed the timing was right and went ahead with the NASA Spec Miata class. We held the first-ever Spec Miata race in February 2000 in the NASA NorCal region. The amateur-road-racing market was hungry for a low-cost, highly competitive series that Spec Miata filled perfectly.

THE NATIONAL STAGE

DANIELS: An SCCA committee was formed to take Spec Miata to the national level. It had to happen, because without a national championship, you can't attract the best racers. The

class would have stayed small-time.

But then, the SCCA brass declared that Spec Miata would never go national and dissolved the committee.

DOWIE: There was a little bit of turmoil. That group lost focus on the main issue, which was settling on the rules. They were obsessed with getting a national class. Jim [Daniels] was ready to burn down the farm to get it done.

DANIELS: The old guys were making secret changes to the general competition rules to prevent Spec Miata from being added as a national class, without taking it to a vote of members. I was tipped off by a source inside the SCCA. So, I took that information public on our website. As a result, I was blackballed from SCCA's committees and boards for years. Maybe I still am. But the membership rose up and demanded a Spec Miata national class.

DOWIE: Well, I don't know about that. The process took a year, which is what's supposed to happen.

DANIELS: But once it went national, it exploded. When the economic downturn hit, it was only Spec Miata racing that kept some of the regions going. Our region would have gone bankrupt. A lot of these regions derive 60 percent or more of their income from Spec Miata.

McMASTERS: Without Spec Miata, the SCCA would have folded.

DANIELS: You could add another national class now just for the 1.6-liter cars, and they'd still have too many entries for a single race. There are hundreds of old Spec Miatas sitting around waiting for a chance to race. There's never been a car as perfectly suited for amateur racing as the Miata.

McMASTERS: No other car could have done it. No other car is that fun to drive, that reliable. It was the natural choice.

WHO'S THE BEST SPEC MIATA RACER OF ALL TIME?

JOHN DOONAN, Director of Motorsports, Mazda North America: If you define greatness by where you ended up, I'd vote for [Grand-Am driver] Tom Long.

DOWIE: There are so many of them, but Jim Daniels was a hell of a race-car driver.

McMASTERS: I'll tell you one thing . . . it wasn't Jim Daniels.

DANIELS: Well, I won the most races. ■

We haven't even driven a U.S.-spec Miata yet, but Mazda is wasting no time preparing a racing version.



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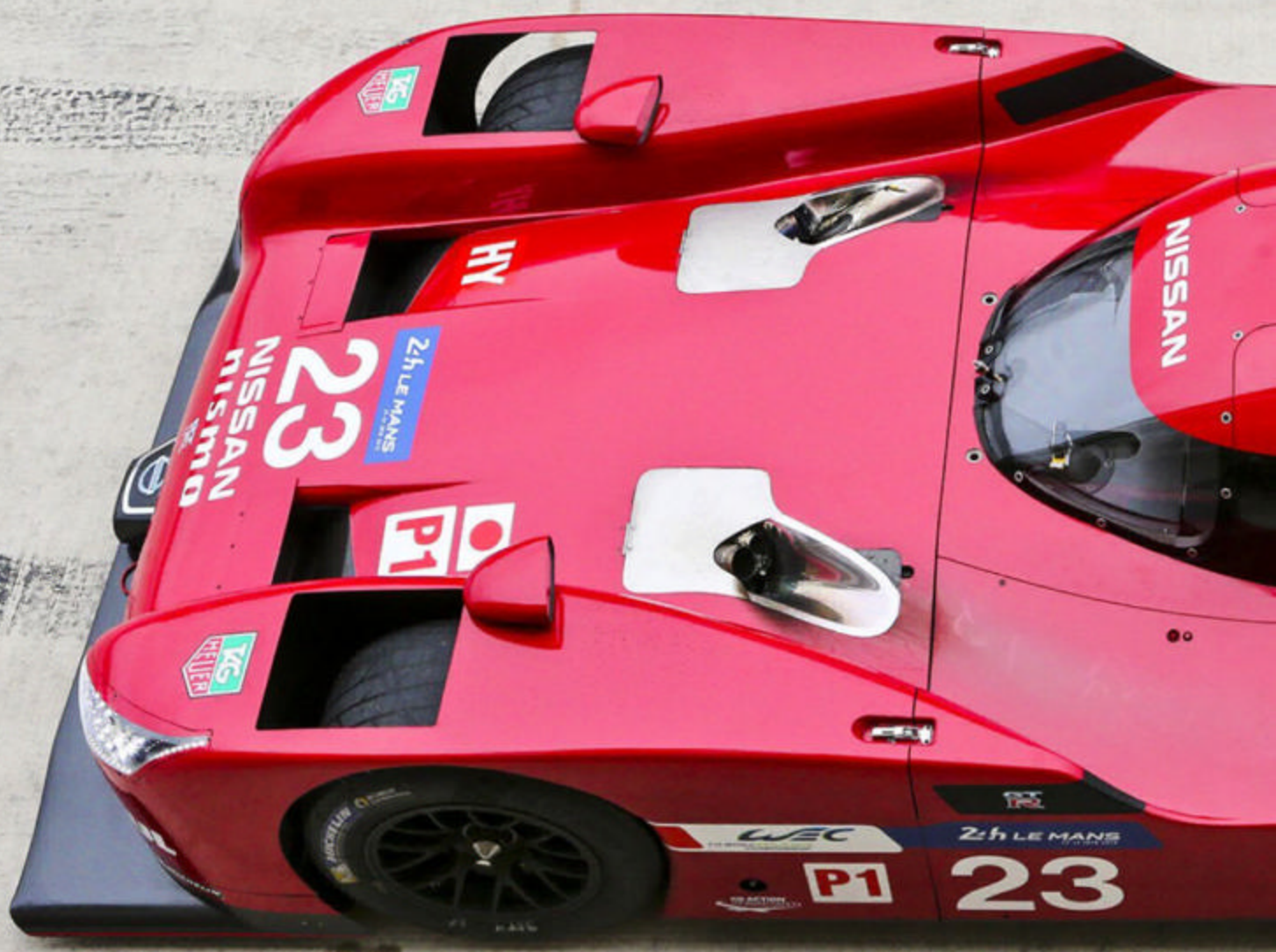


NISSAN'S MAD SCIENCE

UNBOUND BY CONVENTIONAL THINKING, NISSAN IS BRINGING THE CRAZY
BACK TO LE MANS. INSIDE THE WILDEST NEW RACE CAR IN DECADES.

BY MARSHALL PRUETT | PHOTOGRAPHY BY MAREK GLASER & MARSHALL PRUETT





BEN BOWLBY APPROACHES RACE-CAR design like an abstract painter approaches a canvas: with zero regard for convention or tradition. His phallic DeltaWing roadster, which competed at Le Mans in 2012, was easily the most polarizing racing creation in decades. His follow-up, the hybrid Nissan ZEOD RC, with its pocket-size, three-cylinder turbo engine and enough onboard electricity to power the car for an entire lap of la Sarthe, cemented Bowlby's reputation as the most iconoclastic race-car designer of our time. These wide-

hip, narrow-nose cars were penned with a ruthless adherence to the "form follows function" ethos, but both have served their purpose and are now footnotes for Bowlby, who has intentionally severed their bloodlines. If the DeltaWing answered a question no one was asking, the latest Bowlby creation is meant to meet endurance racing's greatest challenge: taking down the dominant Audi team, which has won 10 of the past 11 years, at the 24 Hours of Le Mans. Bowlby's attempt to conquer Audi is incredibly brave, career suicide, or both.

Teased in a Nissan ad during the Super Bowl, Bowlby's front-



This era's race car/science experiment features engine exhausts in the hood and narrow rear tires.

engine, front-wheel-drive GT-R LM Nismo asserted itself as the contrarian prototype—the atomic punk among conventional thinkers. With its forever-long hood, narrow rear tires, and ambitious hybrid system, it's an extreme, and extremely unproven, approach to winning the world's biggest endurance race.

Several classes run at Le Mans, but the LMP1-Hybrid cars (also called “P1” cars) are the headliners. These are wildly complex, purpose-built racers that use a combination of electric and petrol propulsion. The rulebook that governs these

spaceships is wonderfully thin. The cars have to weigh at least 1918 pounds and conform to a basic set of dimensions and aerodynamic restrictions. The type and size of the engine are not specified.

Nor is the method by which the car harvests energy produced during braking. Teams are also free to use any type of energy-storage system.

These rules have spawned incredible diversity. Porsche's car runs a small turbocharged V-4 engine. A glorious, naturally aspirated V-8 powers the Toyota. Audi runs a diesel. All



The Nissan during testing at the Circuit of the Americas, seven months before its planned debut at the 24 Hours of Le Mans.

of them use the combustion engine to power the rear wheels and electric propulsion to motivate the fronts. The benefits of their all-wheel-drive systems are undeniable, from easing the burden on their primary drive tires at the rear to improving traction in every condition.

Initially, Bowlby's Nissan was also designed to be four-wheel drive. The first version of the GT-R LM had a rear-wheel-drive system that provided all-wheel-drive capabilities by splitting its hybrid power between both axles, but that package has been shelved for 2015 in favor of front-wheel drive. It's the one notable drawback Nissan has been forced to accept as it prepares for the car's 24-hour debut this June.

Bowlby knows making do with front-wheel drive is far from optimal. "The front of our car has more work to do than the others'. We're steering, braking, accelerating, and harvesting energy through two tires, whereas others use four," he says. "And we carry a great deal of our weight at the front, while the rest are in the 50/50 weight-distribution range. We will pay a penalty in tires, because the front of the car is highly stressed. Every car has its primary challenge, and this is uniquely ours."

Yet Bowlby, whose furrowed brow and bookish ways evoke a Cambridge professor more than a freewheeling race-car conjurer, makes no apologies. Audi, Porsche, and Toyota have funneled more than \$1 billion into developing their mid-engine, rear-wheel-drive P1 platforms in recent years. Trying to rise above the opposition with a version of the same layout was never

a consideration for Bowlby, who came to the stark realization that, in the absence of big financial horsepower, victory could only be attained through creative extremes.

"If we did a car that was an attempt at an Audi concept, with the diesel engine in back, the same-size tires, and a seven-speed gearbox, we're just going to do everything that Audi is doing," says Bowlby. "And I promise you that we wouldn't beat them. Certainly not in the first year. Our job is to think outside the box and give ourselves the best opportunity we can. That is the crux of what Nissan is doing with the resources that we have for the project: look at every opportunity and maximize our position. That is why the car is the way it is. We are doing it differently at every level."

Bowlby approached the Nissan as an aerodynamic exercise, working backward to place every component within a 6.2-by-15.2-foot body to create a P1 car with absurdly low drag. He was inspired by Bob Riley's front-engine 1983 Mustang GTP and the unique internal airflow system from Dan Gurney's 1991 Eagle MkIII GTP. Starting with a carbon-fiber chassis supplied by Gurney's All American Racers in Southern California, Bowlby's design team built the car in modular sections. A bespoke 3.0-liter twin-turbo V-6 is bolted to the bulkhead, the transmission housing and five-speed gearbox are attached to the front of the motor, and the radiators and splitter hang from the drive unit, completing the front of the car.

By elevating the turbos and the engine's exhaust headers to



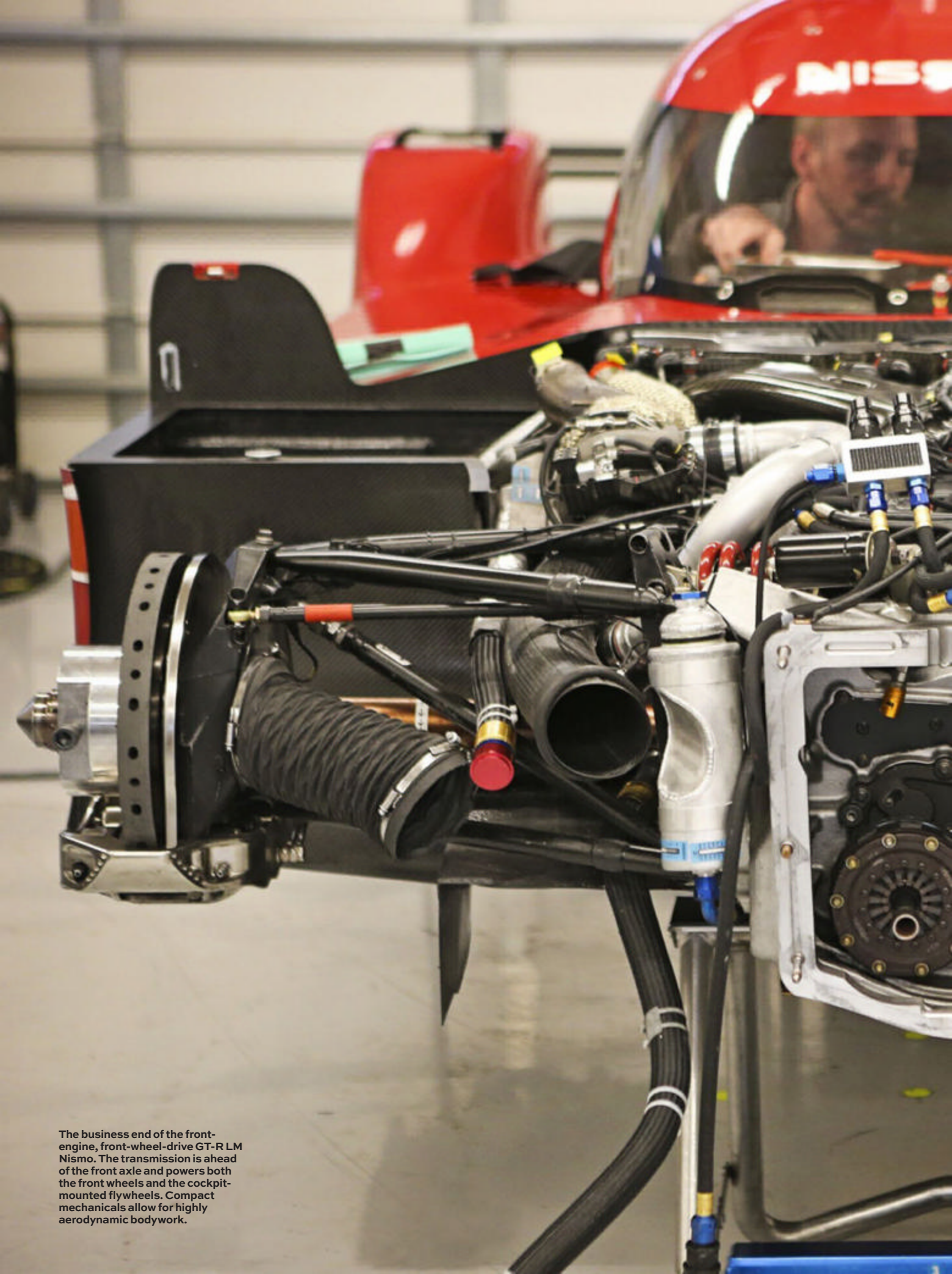
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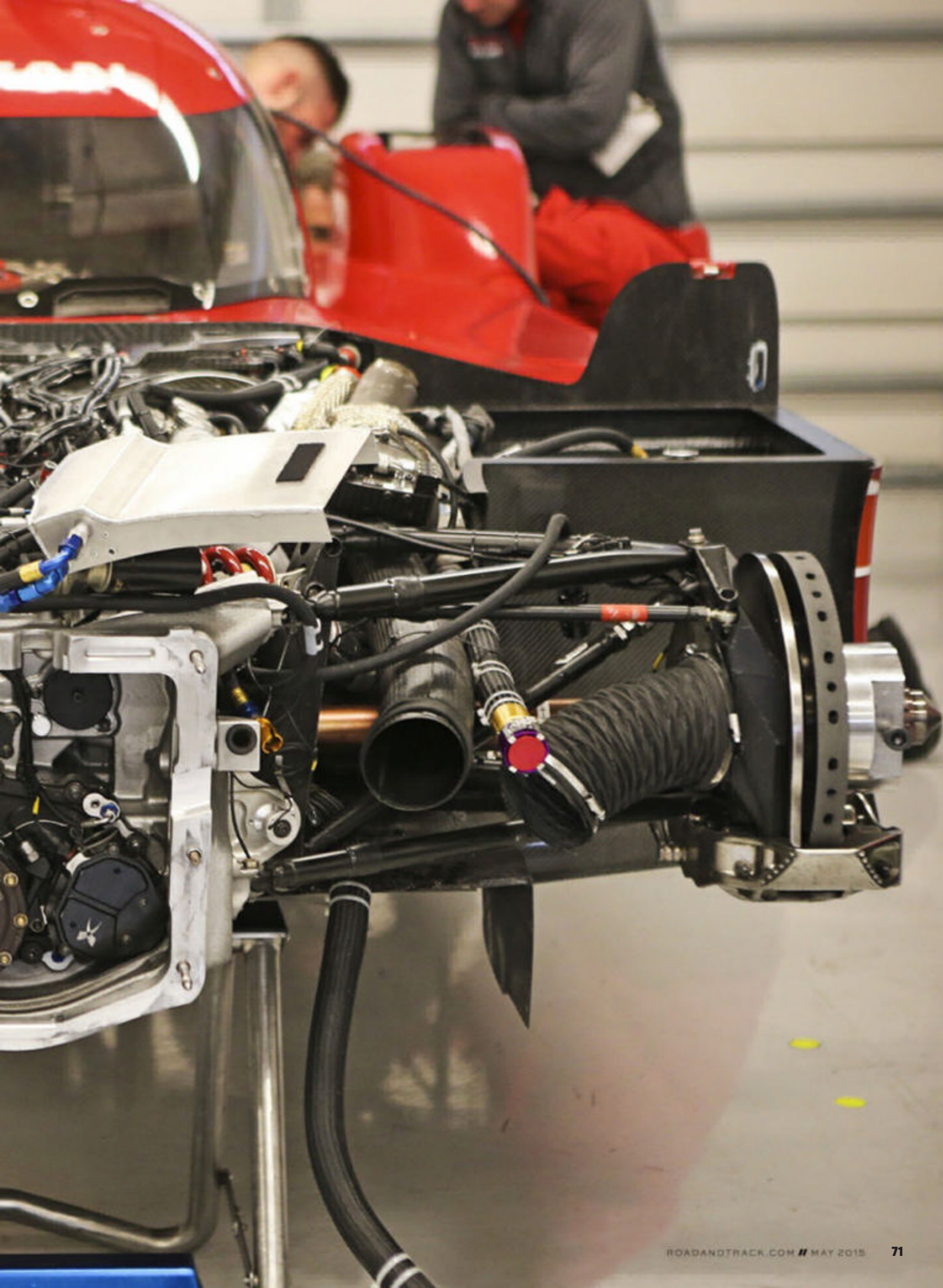
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The business end of the front-engine, front-wheel-drive GT-R LM Nismo. The transmission is ahead of the front axle and powers both the front wheels and the cockpit-mounted flywheels. Compact mechanicals allow for highly aerodynamic bodywork.





exit through the top of the hood, Bowlby cleared valuable space for his through-flow ducting system, the car's conceptual aerodynamic masterstroke. The system takes high-speed airflow from beneath the splitter, ramps it upward beneath the engine's forced-induction system, and routes it along both sides of the cockpit through rectangular tunnels. The tunnels end at the rear of the car, where the airflow rejoins the air exiting the splitter. The GT-R LM Nismo's front-engine layout might draw the most attention, but the through-flow system's dramatic reduction of aerodynamic footprint is actually where Bowlby has, in our opinion, truly advanced the state of the art. If the GT-R LM achieves its full potential on the long straights at Le Mans, the team could have a full-size car that cheats the air like a three-quarter-scale model.

"The through-duct concept showed great promise at the beginning of development," Bowlby says. "It had enough potential to really encourage a deep dive into this layout. It is a very important part of this project, and it is a clean and simple, space-efficient way to do things with air that you simply cannot do with a conventional design."

Bowlby completed the Nissan's aerodynamic treatment by taking a page from the DeltaWing and fitting staggered wheel sizes front and rear. But whereas the DeltaWing famously had large rear footwear and small, closely spaced front tires, the GT-R LM has the reverse: big, 14-inch Michelins up front and custom nine-inch rears to further reduce the car's wake.

That is daylight you see in the rear-bumper area, as tunnels channel air through the car to reduce drag.

"If you've got a great big tire running through the air and a much narrower one, which one is going to have the most drag?" Bowlby asks.

"The smaller rear tire is there because it offers a significant drag reduction." Other than flipping the Nissan to run upside down, there are few norms left for Bowlby to defy with the GT-R LM Nismo.

The Nissan was initially expected to create a total of 2000 hp from the combination of its internal-combustion engine and mammoth hybrid energy-recovery system. Mounted below the cockpit, the mechanical flywheel hybrid system harvests stored energy from a shaft that runs through the engine's vee from the transmission. Under braking, the shaft is engaged to spin the flywheels through a separate mini gearbox. The spinning flywheels hold the stored energy until it's deployed under hard acceleration, like a jet fighter being launched off an aircraft carrier. The beauty of this hybrid system is that it doesn't suffer from the inefficiencies of converting mechanical energy to electrical energy, like a battery-based system does.

With 625 hp from the engine and brief, three-second 1375-hp pulses from the hybrid unit, the GT-R LM would have turned up at Le Mans with a gaudy output figure twice that of the Toyota and significantly more than the Audi and the Porsche. Once practical limitations to the system were realized by its manufacturer, Nissan decided that the hybrid hardware would make the same 625-hp contribution as the gasoline engine, which reduced output to 1250 hp. That's right: down to a mere 1250 hp.

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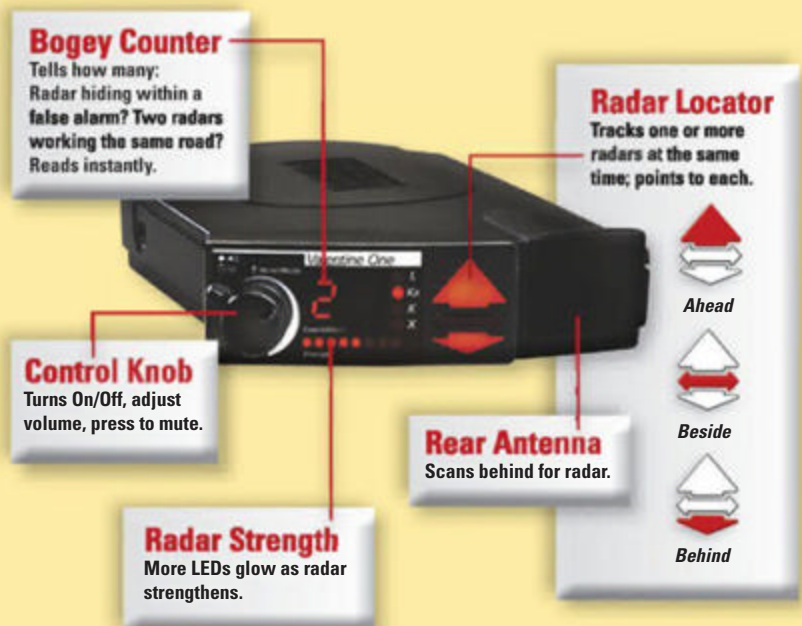
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"We haven't got megamoney and the heritage at Le Mans, and I don't need to tell you we're the underdogs," says Nissan Motorsports boss Darren Cox. "Goliath had the wrong tools. David had the right tools. Have we the right tools? We think so."

Bowlby's previous Nissan-powered creations might have looked as though they fought the laws of nature with every compound curve, but his newest masterpiece speaks to a more holistic

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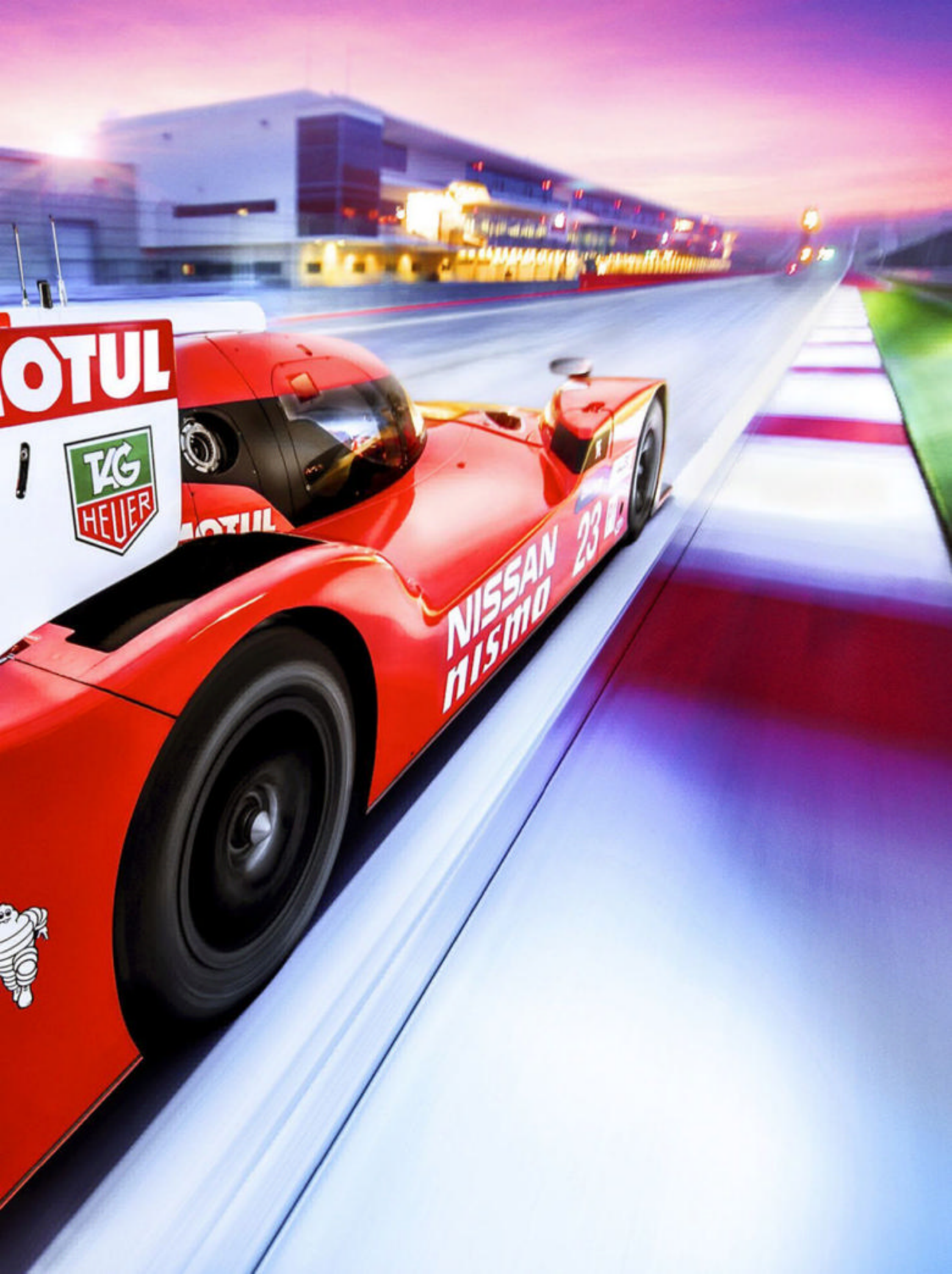
approach to the interaction of air and gravity. We don't know if Bowlby is a devotee of Frank Lloyd Wright, but there's evidence of the great American architect's philosophy that "form and function should be one, joined in a spiritual union" from nose to tail in the car. Although the Nissan looks radical alongside its rivals, there's an aesthetic purity within its laid-back, low-slung profile. As different as it is, though, the GT-R LM is by far Bowlby's most mature sports-car design.

The GT-R LM Nismo is also a complex, interconnected assembly of constraints and ambitions. With the other P1 cars as the control group in Nissan's grand experiment, Bowlby's car is downright unhinged. It's designed to provoke, to incite. It's the fire starter in the crowd. Nissan wants to win at the loudest possible volume, and in the absence of champagne and trophies, causing an unforgettable riot will suffice.

"I think that if we had shown up at Nissan headquarters in Japan with a car that looked like all the rest, we would never have received a green light for the project," Bowlby says. "We have made a Le Mans special, and the recipe for Le Mans is to achieve exceptional speed and time on the straights, often at the expense of ultimate cornering potential. This is a viable compromise. It's not right or wrong. That is how we'll get measured. And that is the car we built." ■

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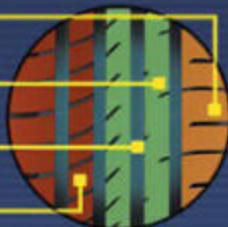
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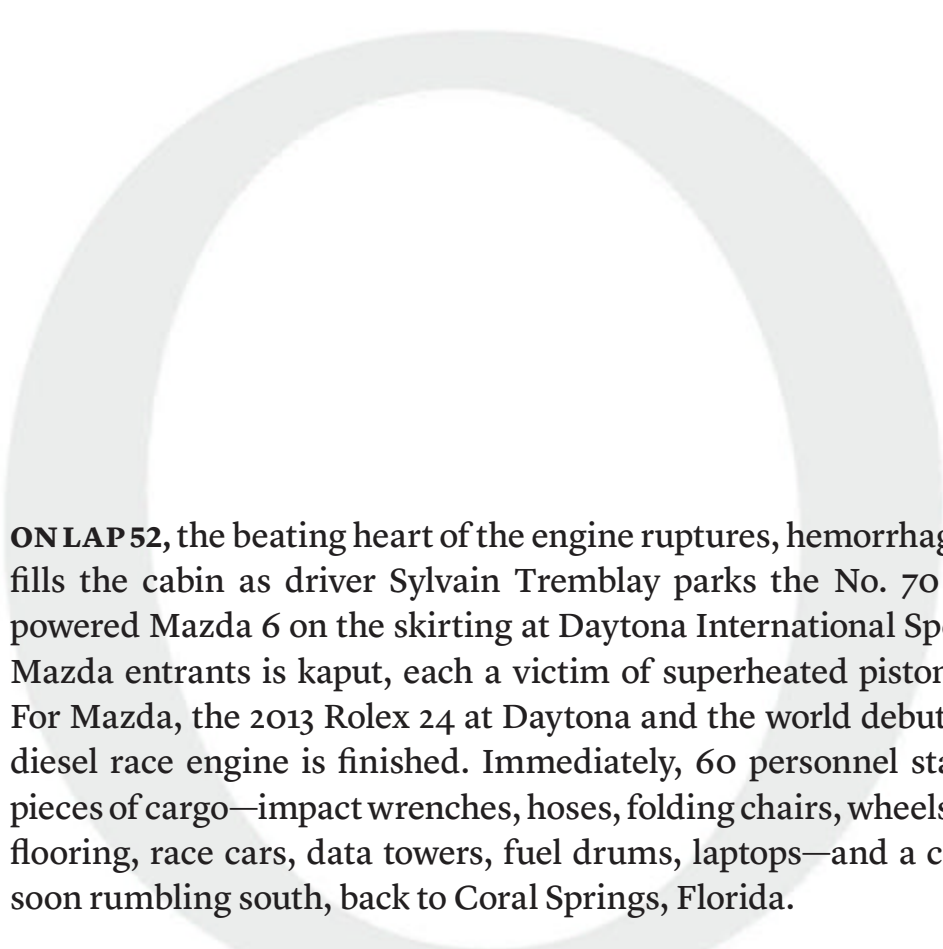


THE SHORT, BRUTAL LIFE OF A RACING PISTON

**FAILURE BEGETS PROGRESS. HOW MAZDA'S RETURN
TO TOP-TIER RACING BEGAN WITH A SINGLE MANGLED PART.**

BY JOSH CONDON

PHOTOGRAPHY BY JOSH SCOTT & JAMEY PRICE



ON LAP 52, the beating heart of the engine ruptures, hemorrhaging oil onto the track. Smoke fills the cabin as driver Sylvain Tremblay parks the No. 70 Grand-Am GX-class diesel-powered Mazda 6 on the skirting at Daytona International Speedway. The last of the three Mazda entrants is kaput, each a victim of superheated pistons melting in their cylinders. For Mazda, the 2013 Rolex 24 at Daytona and the world debut of its new production-based diesel race engine is finished. Immediately, 60 personnel start repacking nearly 80,000 pieces of cargo—impact wrenches, hoses, folding chairs, wheels, radios, granola bars, rubber flooring, race cars, data towers, fuel drums, laptops—and a caravan of five semitrailers is soon rumbling south, back to Coral Springs, Florida.

In a 24-hour contest, all three Mazdas surrendered in less than two hours.

DESTRUCTION AND REJUVENATION

Why do major manufacturers invest in racing? As a sport, it has the dubious qualifications of a shaky fan base and massive expense, with top-tier teams spending roughly the annual cost of a space program. (Last year, for example, it was widely speculated that, between the Audi and Porsche efforts at Le Mans, the Volkswagen Group spent as much as a billion dollars.) Elsewhere, you have factory teams closing up shop just weeks after celebrating a championship, as Chrysler did with its victorious SRT Viper GTS-R program in the Tudor United SportsCar Championship (TUSCC). “Win on Sunday, sell on Monday,” has been dead for decades.

Still, the image of the racetrack as proving ground endures. It’s said that every mile of road racing is equivalent to 1000 miles on a public highway. That’s easy to believe. From a mechanical standpoint, the sheer brutality of endurance racing is staggering. A 24-hour race like Daytona is World War II waged in a suitcase strapped to a roller coaster—hundreds of thousands of explosions and unimaginable heat, friction, stress, and violence, hour after hour, for one full rotation of the earth.

This challenge, Mazda will tell you, is why it rolled three cars powered by a modified version of its then-new four-cylinder turbodiesel production engine onto Daytona’s grid two years ago. With strong ties to U.S. grassroots motorsport and a race-what-you-build ethos, the Japanese manufacturer needed

something to replace its championship-winning, rotary-engine RX-8, which ended production in 2011. The Mazda 6 GX was based on a lengthened version of the RX-8’s tubular-steel space frame, and its 2.2-liter oil burner retained 51 percent of its stock components, including the upper engine block, lower engine cradle, front timing cover, and cylinder head.

“Mazda asked us to see how many production parts we could use on this racing engine,” says Tremblay, a compact, plain-dealing Canadian who races Mazda’s factory cars and owns SpeedSource Race Engineering, the manufacturer’s Florida-based motorsport-development partner. “We could have taken the easy way out, taken a race motor with bespoke everything, put a nice Mazda decal on it, off we go.” He grins when he adds, “Mazda chose not to go that particular path.

“Some manufacturers talk about ‘technology transfer,’ but you can’t unbolt a part off their diesel prototype engine and put it on one of their street cars. We can.”

We wanted to explore why manufacturers continue to go racing. On the heels of another very public development struggle in the 2014 TUSCC, Mazda presented an intriguing answer. Through SpeedSource, the company agreed to give us unprecedented access to its cars, facilities, engineers, files, and data.

A race car exists in only two states: broken or in the process of becoming that way. To fully understand racing is to understand a rigorous management of failure. Therefore, parsing a season’s worth of destruction and rejuvenation would be like



explaining heartbreak through neurochemical minutiae: massive in scope and scale, but missing the point. Instead, we'll let a single component, a piston, illustrate the larger story; a scarred, pitted piece of metal no bigger than a clenched fist will act as totem for the whole grueling process.

“WHAT AM I SUPPOSED TO DO HERE?”

On January 2, 2013, 24 days before the green flag dropped at Daytona, Mazda-SpeedSource piston B0311Ub revNC (“B03” for short) arrived at SpeedSource headquarters, a white, featureless stucco warehouse in a lush corner of Coral Springs. There's a house number but no sign, and smoked-glass doors obscure a reception area ringed with dozens of empty champagne bottles on high shelving.

B03 began life here as a computer sketch, the result of one month's design work to upgrade the Skyactiv engine's stock pistons for racing duty. After the piston's architecture was subjected to SpeedSource's thermal and structural simulations, a solid CAD file was sent to supplier CP-Carrillo in California, which manufactured the component from forged billet aluminum. B03 was the last of six variations produced before the Daytona 24. Once it arrived from CP-Carrillo, an engineer put the piston through a 30-minute quality-control process, checking critical dimensions using reverse-engineering software and a Faro measuring arm that resembles a large, multijointed ball-

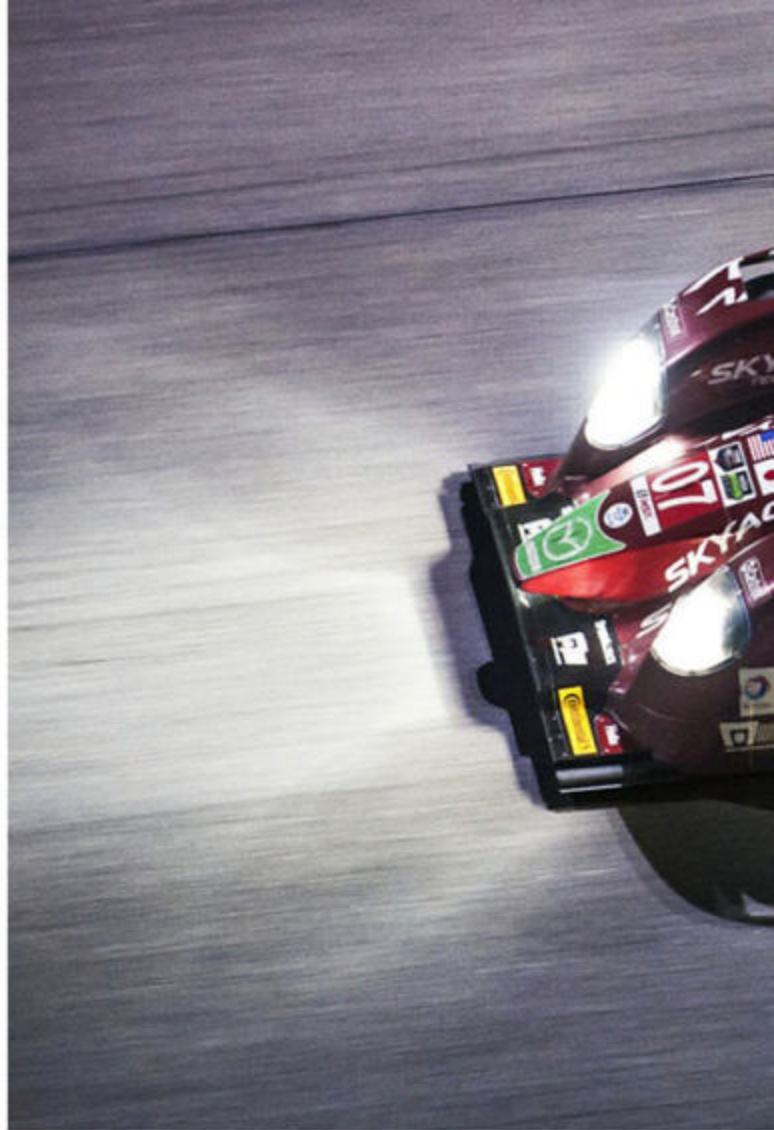
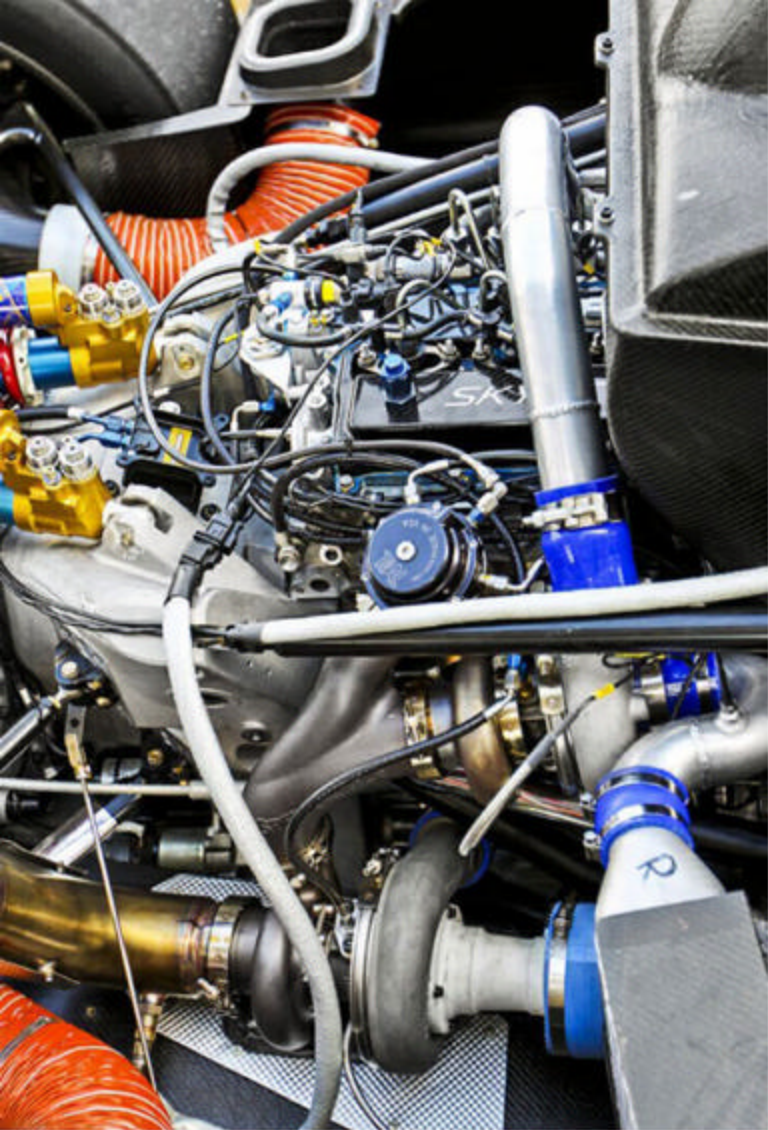
point pen. On January 7, B03 was installed into engine number 5005, which then underwent a two-hour break-in session on a dynamometer before being crated and sent to Daytona Beach.

Several days later, in front of tens of thousands of racing fans, piston B03 liquefied in its cylinder under monstrous heat, and the situation inside the engine quite reasonably went to hell.

Car No. 70 was shipped, untouched, back to SpeedSource for a thorough breakdown and analysis over the course of five days. A massive Magnaflux testing apparatus hulked against the back wall next to a CNC machine. Nearby, behind a locked, unmarked door, a secure server housed terabytes of proprietary Mazda development data. The 50,000-square-foot facility also has a fabrication area; a carbon-fiber bodywork repair stage; engine, chassis, and damper dynos; and a testing and storage facility overflowing with turbochargers and gleaming aluminum engine blocks and cradles.

Despite these resources, most of B03's postdestruction evaluation was outsourced to CP-Carrillo's parent company, Pankl Racing Systems, an Austrian firm that provides engine and drivetrain components for the racing and aerospace industries. Pankl conducted a variety of investigations, including cutting B03 apart to perform hardness testing at various points throughout the piston. This data, analyzed with consideration for aluminum's material properties, showed Pankl engineers

The 2013 GX-class Mazda 6 was built on a modified RX-8 frame but featured a new, production-based turbodiesel.



the kinds of temperatures and pressures B03 saw before failure. To reduce turnaround time, SpeedSource provided CP-Carrillo with a detailed if-then scenario prior to testing, so the supplier could immediately manufacture a new piston based on the results. Analysis took six weeks.

"I remember the process was six weeks, because it was so frustrating," recalls SpeedSource engineer Zach LaGrone. "I was like, 'Come on, guys, what the f*** am I supposed to do here?'" As engineers in Austria ran the numbers, a wall-mounted digital clock in Coral Springs ticked down the hours until the next race, the Grand-Am of the Americas in Austin, Texas, on March 2, 2013. With a new piston design still in limbo, the Mazda team had to figure out an interim solution.

SpeedSource engineers' own brief analysis made it clear they had to lower cylinder pressure and increase cooling—two avenues that could be explored independent of piston design—if they were to have any hope of avoiding another meltdown. To that end, multiple efforts went toward lowering intake and exhaust temperatures and recalibrating the fuel-injection system to use two or three injections instead of one.

"We revised some of the engine calibration to give up, if not peak power, some areas in the power curve, to reduce the pressure and the temperature inside the cylinder and to squeeze more life out of [the piston]," LaGrone says. "It basically became

a management change: maximize reliability while losing as little performance as possible."

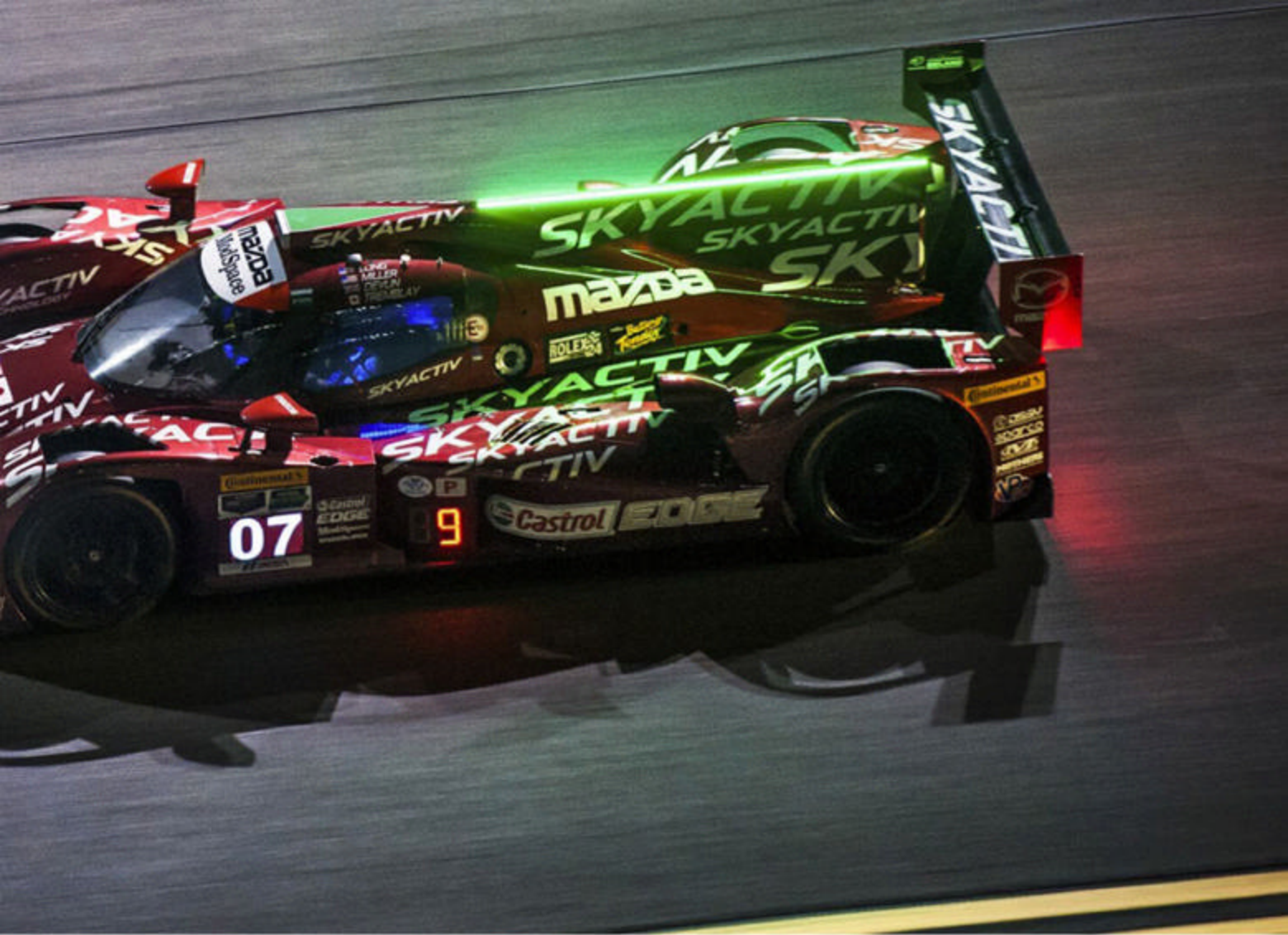
Despite their efforts, the sacrifice hobbled the cars. Mazda came in second and third, out of a class of three, in Texas. The No. 00 car did not finish due to driveshaft issues.

The revised piston arrived on May 3. Pankl had concluded that B03's failure was due to thermal fatigue, with issues tracing back to inaccuracies in the early simulations. Because the original

piston was meant for commuter cars and the race version was untested in competition, SpeedSource used various industry standards as data points during initial testing. Those figures grossly underestimated how hot things would get under the hood. Analysis showed exhaust temperatures in the No. 70 car reached between 1200 and 1300 degrees Fahrenheit, peak cylinder pressure hit 3600 psi, and piston B03 itself heated to more than 750 degrees before failing. (A typical production turbodiesel engine wouldn't see peak cylinder pressure above 2900 psi.)

Cylinder pressures in diesel engines are typically much higher than those found in gasoline engines. This makes diesels more efficient but also hard on pistons, because more pressure means more heat and more abuse. CP-Carrillo's new design used a revised bowl that traded some combustion efficiency for durability, two oil jets for each piston for better cooling, and a ceramic thermal-barrier coating on the firing face.

THE PISTON HEATED TO MORE THAN 750 DEGREES BEFORE FAILING.



The Skyactiv turbodiesel from the GX-class racer (left) would continue development and run in the Tudor P2 class at the 2015 24 Hours of Daytona (above).

ation also improved surface-temperature consistency, reducing hot spots that could accelerate thermal fatigue. And due to the concurrent efforts in Coral Springs, “when the piston came back, we put it into a better overall system,” Tremblay says. “That’s called stacking your advantages.”

After minor tweaks to the thermal coating, the new piston design remained nearly indestructible. Mazda went on to win the last nine races of the 2013 season and the GX-class manufacturer’s championship.

THE LONG, SLOW ROAD

Triumphs in racing are fleeting. The GX class lasted only a year before succumbing to the Grand-Am/American Le Mans Series merger that resulted in the TUSCC. But because of its dual-development program, Mazda happened to be readying a prototype-class car running the same 2.2-liter turbodiesel engine (further modified to handle the significant power and torque increases) that would compete under the new banner’s P2 class in 2014.

Unfortunately, Mazda’s 2014 Tudor season was a wreck, its cars plagued by heat issues from the cylinder head.

Geometry changes decreased the compression ratio, for reduced pressure and lower peak gas temperatures. The new iter-

“The choice to fit a production-based turbodiesel into a proven prototype body seems like it should have resulted in speed and reliability, like with Audi and Peugeot’s oil-burning P1 cars from almost 10 years ago,” says motorsport journalist and *R&T* contributor Marshall Pruett. “But those cars were designed from scratch around diesel engines—cooling and airflow took precedence over every line drawn.” Not so with the Mazda. The team was constantly battling to figure out how its powerplant could perform in a foreign engine bay. Thus, the season became an endless mediation between two strategies: run at full steam and risk having the integrated exhaust manifold melt its casings, or turn down the wick and try to jog to a slow finish. It was a negotiation where no one won—literally. Neither prototype broke the top five in any race, and at least one of the Skyactiv cars failed to finish in nine of 11 contests. “It was a season of hard-fought lessons,” Pruett says.

Which brings us back to Daytona. It’s a crisp, windy January day, with preparations in full swing for the 2015 Rolex 24. Grandstand speakers blast “Gimme Some Lovin” over the starting grid as Tremblay and the other drivers—Jonathan Bomarito, Ben Devlin, James Hinchcliffe, Tom Long, Joel Miller, and Tristan Nunez—circle a pair of cars that now feature reengineered cylinder heads. It’s a departure from the stock piece, with the exhaust manifold moved to the outside of the engine and all water passages rerouted. Mazda’s director of motorsport, John Doonan, explains that the previous design



was fine for road-car horsepower and torque and heat limits. “But we were asking it to do three times what it’s designed to do,” he says. “The directive is always, ‘Let’s use as many stock components as you can, to see what the limits are.’ Well, when it comes to the stock cylinder head, we found those limits.”

Just before the green flag drops, I’m handed a team radio and a bulbous, noise-canceling earpiece. Spectating a 24-hour race is itself a feat of endurance, and as the minutes tick by with expressionless engineers staring at telemetry screens, the pandemonium of the racetrack is reduced to a quiet patter, a lulling form of near nonsense:

“If you’re the last car, still inside. Still inside.”

“24 engine temp; 118 oil.”

“Safety car lights out, we’re going green this time.”

“Stay in line until we get to the line.”

Everyone in the tent perks up in hour two. There is an electric excitement as the No. 07 car’s superior fuel economy allows it to stay on track with fewer pit stops, putting it in a position to lead for a few glorious laps. It is a small victory, but given the struggles of the previous seasons, it’s significant.

It’s also short-lived. Around 9:00 p.m., after 198 laps, the No. 70 car retires due to an oil-pump failure. Hinchcliffe, behind the wheel at the time, gives an animated recounting of the incident.

“I got the wave around, went up through first, second, third, fourth, fifth . . . BOOM!” He smacks his hands together with

the sound. “I knew it was bad. It sounded gnarly.”

Several hours and 150 laps later, the No. 07 car bows out due to high-pressure fuel-line issues. For the third year in a row, the Mazda team packs up early as the race howls on. By 4:00 a.m., the empty space where the Mazda tent stood just hours before looks like a crater. By sunrise, Tequila Patrón Racing has taken over Mazda’s vacated garages. When Chip Ganassi Racing’s Scott Dixon, Tony Kanaan, Jamie McMurray, and Kyle Larson raise the trophy that afternoon, SpeedSource is already on the long, slow road back to Coral Springs. This is a business, after all.

But it’s hardly Mazda’s only business. Like all automakers, Mazda is part of a relentless, global race into driveways and Whole Foods parking lots and your cousin’s garage. Podiums and champagne are great, but they aren’t the ultimate goal.

“As racers, all of us at Mazda go to the track to win, every time out,” says Doonan. “Some might see our struggles in the public eye as failures. But we race to learn, to prove our road-car technology. We see the process as a victory.”

Prizes for this type of competition are subtle and awarded without fanfare. Doonan describes a phone call he received a few weeks prior, a request from Mazda powertrain engineers in Japan who want to study the racing piston. There’s a possibility it will be used in the next diesel production engine. They know, even in the face of unthinkable pressure, it will not break. ■

Hinchcliffe (in red) is left to contemplate No. 70’s DNF at Daytona, but Mazda promises it won’t stay down.



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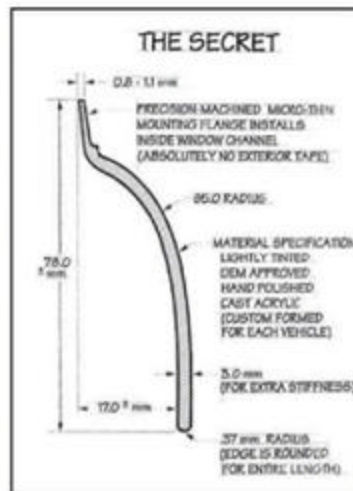
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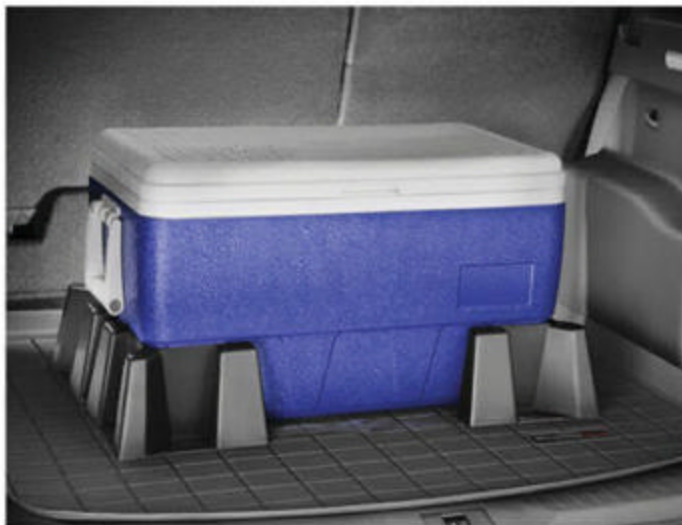
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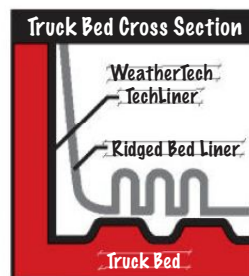
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A photograph of a racetrack. In the foreground, a red flag lies on the asphalt. In the background, a wall of stacked tires runs along the track, with a dirt embankment and a fence behind it.

ALWAYS MEET YOUR HEROES

VINTAGE-BMW FANBOY **SAM SMITH**, A 1970 2002ti,
AND THE ROLEX MONTEREY MOTORSPORTS REUNION.
THERE'S NO GOING BACK FROM HERE.

PHOTOGRAPHY BY CHRIS CANTLE & SHELBY KNICK

They put my name on it.

S-A-M and S-M-I-T-H on the side windows, next to a small American flag. When the pictures hit my email, a few months before the race, they triggered a sort of coming to grips. An internal conversation began looping in my head:

*“They’re actually going to let me run it.
What if I f*** it up?”*

“Why on earth would you do that?”

*“The car’s sideways a lot.
People make mistakes.”*

*“Stop being silly. It only makes 220 hp.
You don’t usually break things. You’ll be fine.”*

[Momentary silence.]

*“ALPINA COLORS! ALPINA COLORS!
WOO! HOW COOL IS THAT?”*

“So it’s settled.”

*“Oh my God, WHAT IF I F*** IT UP?”*

Months later, sitting on the grid at Mazda Raceway Laguna Seca, those words still echoed through my brain. Never let anyone tell you that emotional connections to cars don’t matter.



THERE ARE VINTAGE RACES EVERY MONTH OF THE YEAR, but few draw such top-class iron as the Rolex Monterey Motorsports Reunion. The Reunion—now in its 42nd year, and colloquially known for the first 35 as the Monterey Historics—comes at the end of California’s famed Pebble Beach “car week” in August. You go there half for the cars that show up—the actual Alfa Romeo P3 with which Tazio Nuvolari won the 1935 German Grand Prix, say, or an entire field of Sixties Trans-Am cars (both there in 2014)—and half because Monterey is a damn Garden of Eden in late summer.

Some 62,000 people attended last year’s races. I was one of them. I’d been to the Reunion before but never driven in it, which is common. Anyone can go to Mazda Raceway Laguna Seca and walk the paddock. To drive, to step into that impossible little motorsport snow globe, you need a historically significant race car. It must be finished as it was in period, and the organizers have to let you in. Maybe they do, maybe they don’t. People have bought million-dollar cars just to find out.

If that sounds elitist, it’s not. It’s just that gobs of drivers want to run at Monterey each year, and the event is currently capped at around 550 cars. Which is how you end up with a Nuvolari Nürburgring Alfa but not your uncle Jimbo’s 800-hp ’69 Z/28, whose only provenance is that it was once in the same zip code as Roger Penske’s third cousin’s dog.

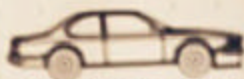
Not to knock that car, but seriously: Nuvolari Nürburgring Alfa.

A HANDFUL OF CARMAKERS make a practice of running cars at Monterey. BMW of North America, for example, owns a race-prepped 1970 2002ti—the twin-carburetor version of the marque’s iconic 2002 sport sedan—that gets woken up for special events like this.

This particular Ti was developed by German tuner Alpina in the late Sixties. It spent part of its life in Europe, then ran in SCCA club racing in the Seventies. I first saw it in high school, at a concours in the late Nineties, after BMW purchased it from the collection of Southern California dealer Vasek Polak. I rode



BMW M1, 1978-1981



BMW M2, 1987-1988



BMW M3, 1988



BMW M3, 1988-1991



BMW M3, 1991-1994



BMW M3

1978





in the car 10 years ago, with BMW factory driver Bill Auberlen, watching as he arm wrestled it through a club event at Denver's Second Creek Raceway. As I got older, the 2002 continued to pop up at vintage races, its friendly face always shockingly small next to anything modern. Seeing it was a happy reminder that, while the world constantly reinvents itself, memories live unchanged in your head. The car also served as a rolling picture of everything worth loving about boxy old iron and the global bar brawl that was Seventies touring-car racing.

And so when Editor Webster suggested that a youngish *R&T* staffer enter the Reunion, to see the event with fresh eyes, I humbly suggested myself, and that we ask to borrow BMW's car. Familiarity would be comforting in Monterey's notoriously expensive traffic, I fibbed. And I could probably be objective about the 2002's merits, I said, lying through my teeth.

CONFESSION: I OWNED A STRING OF 2002S in high school and college. They were fun and durable, like an Alfa GTV that had traded sexual frenzy for working electrics and an interior not made of cheese. For one reason or another, time and exposure turned the model into my default old car of choice. I've broken 2002s, fixed them, road-raced them, done stupid things in them as a high schooler or college kid. For whatever reason, the BMW's cheery mix of feedback and practicality just stuck in my craw.

And the craws of a lot of other people, apparently. About 390,000 2002s were sold worldwide from 1967 to 1976. Small European sedans had been fast and reliable before, but few

made as much of a dent on the automotive landscape. Before the 2002, BMW was virtually unknown outside Europe. After, it had the momentum and funds to become a staggeringly influential power. The four-cylinder, rear-drive 2002 begot the perennially lauded BMW 3-series, which begot the M3, a perpetual industry benchmark.

The Reunion "weekend" covers five days, beginning with weekday practice sessions and ending with spectator-friendly highlight races on Saturday and Sunday. When I arrived at the track on the first day, I met Steve Dickson, vice president of operations at Rahal Letterman Lanigan, the Ohio-based team that manages BMW's historic-race-car fleet in America. As we talked, a passel of vintage Trans-Am cars snorted their way through the paddock. One, a 1970 Plymouth Barracuda, had the words DAN GURNEY on the side. The rest looked like refugees from a Detroit fever dream, all Technicolor hues and famous names on the doors.

"This will tell you a lot about vintage racing," Dickson said, chuckling. "We currently have one of the BMW GTP cars in the shop. Sister car to the one Bobby [Rahal] rolled at Sebring in '86. Motors on those things came apart when they were new. We ran this car at Savannah a few years ago, where the engine popped. We fixed it, then took it to the Historics. An old crew guy for the thing walked up in the paddock. 'Cool to see it,' he said. Then, softly, he says, 'You guys had any motor problems?'"

"Turns out, in period, they were changing engines three or

Smith and a few Penske Trans-Am Camaros. He kindly ceased drooling for this picture.



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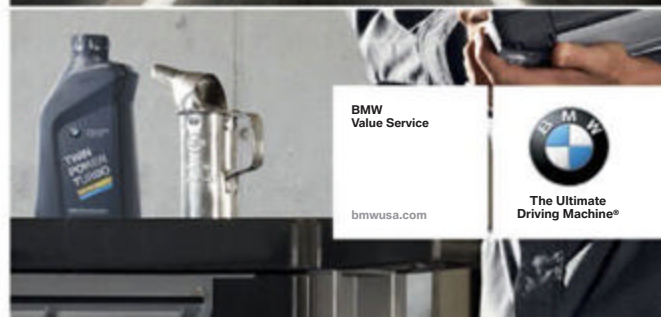
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four times a weekend. Sure enough, later that weekend, the motor pops again. We reassembled it, and Bobby did a test at Mid-Ohio to check for leaks. He comes in after a few laps. ‘Car’s not bad,’ he says. Someone asks him if he’s going back out.

“No,” he says, matter-of-factly. He’s not. ‘Because it’s going to break.’”

As if on cue, a middle-aged man strolled up to the transporter. He looked at the 2002 and smiled sheepishly, hands in his pockets. “You guys, uh, got any parts?”

Dickson raised his eyebrows. The man’s face fell. “No, really. We have a 2002 on the other side of the paddock. Blew a CV joint. Any chance you have an axle?”

And so the same thing that happens at every club race on earth also happens in a sun-drenched dreamland full of pre-war Alfas and eight-figure Ferraris. These are cars, no matter the price, not untouchable gems. They are made of parts, and those parts break, like anything else. Call me simple, but I found that reassuring.

THE ATMOSPHERE AT MONTEREY is a massive part of the draw. There is, of course, the pin-sharp California weather and the

cars. But also the people. At the drivers’ meeting on Thursday, in Laguna’s lower paddock, a greasy morning fog hung in the air, obscuring nearby hilltops. I stood 15 feet from 33-year-old Porsche Le Mans winner Patrick Long and 72-year-old Datsun-Nissan hero John Morton. Long was guest-driving a short-wheelbase, 8000-rpm 911S; Morton was there with a Sunbeam Tiger. Long, in boat shoes and a hoodie, looked like he had just returned from a walk on the beach on a Sunday.

There were a host of warnings. Close racing was encouraged, but to discourage foolishness, lap times wouldn’t be published until late Sunday. And the so-called Canepa Rule, after Northern California sports-car masher Bruce Canepa, was simple: Drop a wheel in the dirt at Laguna’s famous Corkscrew, looking for speed, and you get a black flag. There would be a pallet of tires at the apex, and we were told they would magically move closer to the pavement if stewards saw you shortcutting.

Canepa, at the side of the group, grinned with a “who, me?” shrug. The crowd laughed.

The proceedings were wrapped up by Gill Campbell, Laguna’s no-nonsense general manager. She wore a necklace with a pendant in the shape of the track logo. “The two things I dislike



in historic-racing discussions,” she said, “are tires and contact. Also, it is a privilege to have our pro drivers here. Do not try to beat them. They’re really good.”

And oh, they were. My race group, one of 15, included former Indy driver Lyn St. James in a Lotus 23B. Scottish Le Mans vet Marino Franchitti ran away from Group 5A in a blindingly fast Gulf Mirage. Strolling the grounds was a seemingly endless game of motorsport flash cards: On the false grid before a practice, I photographed a gray-haired man in an Alfa GTA, realizing only later that it was former F1 driver Nanni Galli. I almost walked into a light pole while doing a double take at Andial co-founder and Porsche legend Dieter Inzenhofer. Derek Bell and Steve Millen strolled inches from me in crowds.

The talent-car combination was glorious. On Friday, *R&T* contributor Marshall Pruett put a GoPro camera on Pat Long’s helmet for 20 minutes. The video was on the Internet in less than a day; Long’s car, acting exactly like an old, short 911 should, was caffeinated in his hands. He drove like something was at stake, arms cracking back and forth in hyperprecise snatches of opposite lock. After ogling the footage on my phone on Saturday, I hiked up to the Corkscrew and

watched a 10-car pack of Shelby Cobras burst over the hill and blat down into the fourth-gear Rainey Curve. Every third car seemed to arc past in a tidy, ghosted drift, its small-block Ford thumping and whomping and getting into fittish little arguments with the rear tires. As with Long, I’d seen this sort of thing before, in other places, but Laguna’s magic somehow made it brighter.

Which got me thinking. American vintage motorsport has often been slagged by continentals for its timidity. Admittedly, the pastime seems different in Europe; at historic races on the Continent, it’s not unusual to see four-wheeled history being flogged within an inch of sanity. For whatever reason, that sight is less common in America, replaced by a seemingly greater diversity of driving talent and a priority on exhibition.

This is neither wrong or right, just a difference in philosophy. Interestingly, the Reunion seems to be a mix of the two approaches. This is partly due to the event’s stature—first run in 1974, the Monterey races are prestigious enough to ensure a global draw. (About 8 percent of entries last year were from outside the United States.) Founded by impresario Steve Earle as a

The Reunion’s false grid, next to the garages. Not visible: glorious noise, author’s nerdy Nomex.



**THE CAR WAS LOOSE ON THE GAS, LOOSE OFF IT,
LOOSE ON TRAILED BRAKE, LOOSE IF YOU GAVE IT FLOWERS
AND SAID NICE THINGS ABOUT ITS MOTHER.**

forum to exercise outdated racing cars, the weekend grew from a small gathering to a public festival. It now rivals the nearby Pebble Beach concours for star status—no small achievement.

SO, I RAN TWO RACES. They were great. But in a few years, I'll forget the lap times and the battles with other drivers. I'll remember watching that Nuvolari P3 cough to life one chilly morning, paddock empty save the fog and the winy reek of its exhaust. The hills playing tennis with the echo of Paul Newman's old Nissan 300ZX. And above all, the 2002 itself.

At 220 hp and 1990 pounds, the BMW was quick, if mostly in the vintage sense. (At 1:48 and change, my best lap was more than three seconds slower than the fastest Spec Miata race lap at the 2014 SCCA Runoffs, held at Laguna. Even if you discount your author's workaday talent, that's far from scorching.)

But the car's pace didn't matter. I spent hours poking around the 2002 when not on track, staring at the fiberglass hood and trunklid, the rubber-bushed control arms, the throaty Weber sidedrafts. The single-cam, 2.0-liter four's exhaust exited under the passenger door in a fist-sized, white-oxide pipe. The fiberglass Alpina flares looked like Eighties Hammer pants, as if someone had stuck an air nozzle into the sills and inflated the car like a balloon. The orange and black Alpina livery, freshly paint-

ed that season; the small Sun tachometer; the tiny Momo wheel.

And oh, was it ever a gas to drive. The engine's shove petered off at 7000 rpm, but it sounded like a family of chain saws with a drinking problem. The dogleg five-speed gearbox, a rare period option, had arm-length throws and a vague pattern. It demanded millimeter planning, as if you were teaching someone dance steps for the first time—You will go in this gear now, and then this!—but it kept the engine almost constantly on boil. There was a decent amount of tire, goofily soft springs, chopstick-size anti-roll bars cranked to full stiff. And a limited-slip differential with a good dose of lockup.

The combination felt faster than it was. Even with the bars at full crank, body roll was a giddy sailboat heel. The car was loose on the gas, loose off it, loose on trailed brake, loose if you gave it flowers and said nice things about its mother. You had to bend the '02 into a corner with the quickest of slow hands, wait an instant for the rear to set, then grab the throttle. The BMW would then swing its taillights wide, barely slowing down and usually accelerating.

The whole sideshow (slideshow?) was apparently obvious from trackside. One week after the race, a friend emailed me a phone snapshot showing the 2002 plunging through the

The 2002 and a pair of early 911s in Laguna's famous Corkscrew.

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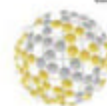
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Corkscrew on opposite lock, black stripes trailing the rear wheels. The shot made me feel like a hero, but truthfully, the car did the work. The only way to keep from drifting was to go almost comically slow; I tried this in practice before realizing the tires weren't staying warm. The next lap, I took the car by the scruff of its neck, tossed it into Turn 4, felt the BMW flick to the apex in a sort of castled jig, and got passed by a Porsche 908/3. After the Porsche disappeared, I tore my eyes from the track for a moment and saw people in the stands actually clapping for it.

Coincidentally, I resolved to be more decisive with the throttle in corners. After which the BMW seemed to come alive, as if to say, *what took you so long?*

The magic of old cars, driven hard: They telegraph their wants in blazing neon. But the experience also reminded me of my deep respect for anyone who drives for a living. After a

particularly draining stint, I got out of the BMW covered in sweat, leaning against a stack of tires for support.

Dickson looked over. "Everything okay?"

"Yeah," I lied. "I just need to go back in time 10 years and hit the gym five times a day to get in shape for tomorrow."

I walked the paddock, stared at the unfathomable history massed there, and thought about that 908. The whirling axles and flex joints, visible between the oil-drum rear tires. The car blurring away from me as the 2002 chewed its way down the straight. How the perfect blue sky and everything good about California rotated around my helmet in the Corkscrew, a spinning planetarium sky, as the car swallowed up traffic and romped down the hill.

BRITISH MOTORSPORT JOURNALIST Denis Jenkinson once said that he resented historic racing, because it attempted to repli-



cate a wonderful era that he and his friends had actually lived through. People took it too seriously, he said, and battle-scarred relics deserved more careful preservation. Jenks seemed to see the pastime as a sort of overblown renaissance fair, just with larger egos and no sense of perspective.

The truth, I think, is less cynical. Racing cars of any era are functional sculpture, and like most pieces of industrial design, they're best appreciated in something like their original use. By the same token, most people lucky enough to strap into a race car will probably do something like racing.

The hang-up comes in repair and use: If motorsport and the spending of equipment are inseparable, what happens when the fenders on Car X are destroyed in a crash? What do you have when the replacements aren't the ones that took Driver Y to glory back when?

Two ideas seem relevant. One, George Washington's ax—with

enough time and use, everything we make entropies into something else. The only cure is to stop the use, which doesn't always serve those items better.

Second, you can't understand how great a 908/3 is until you've had one perforate your ears with its flat-eight or watched its supine fenders chase reflections in traffic. Until you've realized that out there, right now, some living, breathing person is working his ass off in the California light to keep that car underneath him and ahead of someone else.

This is why Monterey is amazing. Track days don't cut it; you need a sense of urgency. And if some honest-to-God racing breaks out in the process, your inner five-year-old freaking out a little just to be there, then we should all thank the universe we're alive, pledge to preserve the equipment, and enjoy the hell out of the moment. Because if that last thing isn't the over-riding point in life, I don't know what is. ■

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BRICKYARD RELICS

SHOPPING WITH COLIN, PAGE 110



SHOPPING WITH COLIN

VINTAGE INDY CAR

BUYING A CLASSIC RACE CAR IS ONE THING, USING IT IS ANOTHER.

The Indianapolis 500: Few races, and even fewer venues, have produced more American ingenuity and childhood heroes. So why aren't more people racing vintage Indy cars, especially ones from the golden age, on road courses?

One reason is that Indy racers were designed to go left. And left. And left again. Another is the brakes—depending on the era, they are either useless or inconsistent. Most old Indy cars are death machines, but they can be housebroken. Is it worth it? You bet your 100 gallons of methanol and Joe Hunt magneto.

After years of owning an early “upright” Indy roadster—essentially a dirt-tracker modified for the bricks—I wanted one from the late-Fifties “lay-down” era or a cigar-shaped car from the Sixties. I found this 1964 Eisert, serial number 1, known as the Harrison Special. It's the second car built by innovative Indy constructor and mechanic Jerry Eisert as well as the second rear-engine American car to race at the Brickyard.

Driven by Al Unser Sr. and Billy Foster, the Harrison Special has an interesting, if not winning, history. It had been restored to a very high level and had run at the Goodwood Festival of Speed, and it retained its original full-race small-block Chevy V-8 and cool Colotti Type 37 four-speed.

The bones were solid, but making this old oval car happy on a road course was quite a process. I converted it from methanol to a diet of 112-octane race gas, mounted a fire extinguisher within arm's reach, and bolted in good seatbelts. Unfortunately, Sixties F1-style chassis are not designed for larger mammals like me, so the fiberglass seat tray had to be cut and widened, the foot-box floor was dropped, the pedals were moved, and a smaller, flat-bottomed steering wheel was installed. Even with tweaks like these, though, an old Indy car will lower your standards for acceptable ergonomics.

After all that, during my first road-course session, I promptly looped the Eisert twice, in the grass, on the first right-hand



WHAT TO LOOK FOR:

ENGINE AND DRIVETRAIN Pick a car with a simple pushrod Chevy or Ford engine. Leave the exotic stuff to museums. Also know that methanol, while the fuel of the Indy gods, is corrosive and will destroy a fuel system if not drained properly after use. The Colotti gearbox is similar to a standard Hewland, except it's difficult to shift and you can't buy parts for it. But, like riding a unicycle, figure out how to use one without looking stupid and you'll do a little victory dance.

CHASSIS While monocoque construction appeared in this era (including in Jerry Eisert's next car), there's artistry in good steel-tube space frames. They're easier to repair, should you have the misfortune of discovering where they bend, and I've found them a little better suited to decades of hard use.

PREPARATION Standard old single-seat race-car stuff: Chassis and suspension parts need to be inspected for cracks, setup is crucial, and maintenance is key. Double-check anything that can cause the car to spin, flip, or otherwise attempt to take flight. Onboard starters and a battery are worthwhile additions. Most old Indy chassis were set up to go left, but it's easily correctable. Make sure you fit and that the roll bar is higher than your helmet. Indy cars have Formula Ford levels of safety equipment but weigh more and have five times the power with about half of the handling. These cars can still kill you. Use your head and enjoy the experience, if not the podium.



RACE READINESS While many are advertised as such, the true "race-ready" car remains a unicorn in the vintage world. Buying one that's been used recently, rather than a car that has been sitting for decades, puts you well ahead of the curve. Old-school fuel tanks should be converted to cells with modern bladders. Be especially mindful of aging magnesium wheels—they crack and corrode and can come apart violently. Review and verify the history and read the logbooks; ask for documentation, setup sheets, and spares lists. This is all valuable stuff.

VALUE Indy 500 winners cost serious, two-comma money. Look for cars that didn't park at the podium. Depending on the builder, era, driver(s), and level of originality, those can be had from around \$100,000 to mid-six figures.

VERDICT I met the car's previous owner and quickly agreed on a trade: my old upright Kurtis Kraft 4000 for the Eisert, straight up. It remains one of my favorite deals. No money changed hands, and I swapped a car I wasn't using for one I thoroughly enjoy and can drive at almost any vintage-racing venue on the planet.



turn. With the original Indy geometry and steering rack, lock-to-lock is measured in days, and neither tire can agree which goes first. New steering arms can be fabricated to speed up the ratio, and bump steer can be dialed down from insane to manageable. The biggest issue, though, is making the dry-sump oil tank behave during right turns, repeated braking, and hard acceleration. At Indy, oil pools on one side of the tank and stays there for the whole race. Adding baffles would help, but the best solution was to replace this pancake tank with a tall, skinny, road-race-style tank that maintains proper oil supply.

The Eisert and its ilk aren't for going wheel-to-wheel in anger. They are historic artifacts to enjoy at 60 percent in competition. But even at those speeds, there's plenty to appreciate in the sound, the thrust, and the history. ■

Contributing editor Colin Comer is R&T's vintage-car buff. By modern standards, he is a reasonably sized mammal.



SPIN DOCTOR

SIDEWAYS HAPPENS (SOMETIMES ON PURPOSE!) BUT NOT ALL OVERSTEER IS THE SAME. HERE'S HOW TO STAY IN THE ACTION AFTER LOSS OF TRACTION.



FRONT-ENGINE, RWD CAR

HOW YOU GOT THERE You mashed the throttle on corner exit.

WHAT THE CAR IS DOING Power oversteer. The tires only have so much grip, which must be split between accelerating and cornering. Hammering the gas can overload the driven rear wheels, which reduces directional stability and fishtails the rear end.

HOW TO FIX IT As the back end slides out, smoothly lift off the throttle and steer in the direction of the skid. (Always look where you want to go, not where you're actually heading.) This counteracts the slide, bringing the rear end back in line.

REAR-ENGINE, RWD CAR

HOW YOU GOT THERE You lifted off the throttle midcorner.

WHAT THE CAR IS DOING Lift-off oversteer. Easing off the gas pitches the car forward, transferring weight—and grip—from the rear tires to the front. The steering input combined with a heavy rear end (the engine's back there) and reduced traction snaps the rear around toward the outside of the corner.

HOW TO FIX IT Don't jump off the gas in a corner. If you've already committed this cardinal sin, gently adding throttle can remedy the situation. If you're really crossed-up, only quick hands steering into the slide will save you from going backward into the hedges.

FRONT-ENGINE, FWD CAR

HOW YOU GOT THERE On purpose with a pendulum turn. (Lifting off the throttle midcorner could also be a culprit.)

WHAT THE CAR IS DOING Lift-off and snap oversteer. In a pendulum turn, you steer and left-foot brake to create violent side-to-side and rear-to-front weight transfer. It's one of the few ways to get a perpetually understeering, front-drive car to go tail-happy.

HOW TO FIX IT Getting a front-driver sideways is tricky, but straightening it out is simple: Keep the wheel pointed where you want to go, apply throttle, and the car almost always sorts itself out.

THE 40-SECOND PRIMER ON OPPOSITE LOCK

OPPOSITE LOCK—a.k.a. “oppo” or “countersteer”—is the act of turning the front wheels into the direction of a slide to control it. If you're turning left and the rear wheels break traction, they will swing to the right. Steering to the right will correct the slide. Unwind your countersteer as the rear end tucks back in, or you'll allow the car to spin back in the opposite direction. And always remember: The faster you travel, the quicker and smaller your countersteer inputs need to be.

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IndyCar heavily regulates almost every part of the race cars running in this month's Indy 500, but shocks are an exception. Teams have entire departments to optimize the hardware that dampens a race-car suspension's movement. Suppliers like Penske kick in, too. The current state of the art for Indy cars is an "inertor," a threaded rod capped with a flywheel that's mounted inside the damper. The rod and flywheel (top left) spin as the shock compresses, absorbing and storing the energy, which is then used to control wheel movement. Developed at Cambridge University for F1 cars, the inertor excels during minute suspension movements, like the ones produced by Indy cars on oval tracks. At over 200 mph, tire vibration is a traction killer, and the inertor-equipped Penske shock quells the quivers. —LARRY WEBSTER

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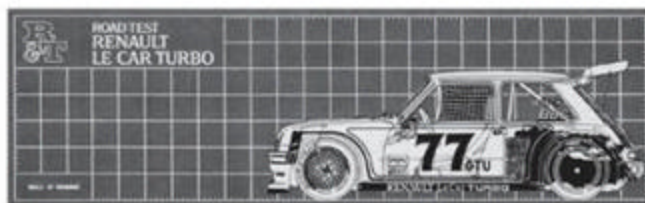
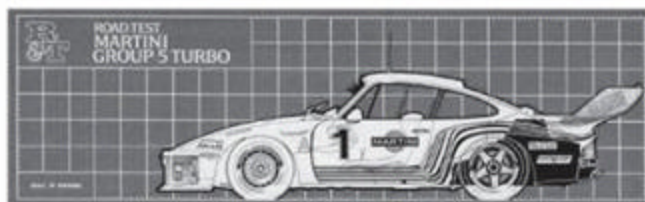
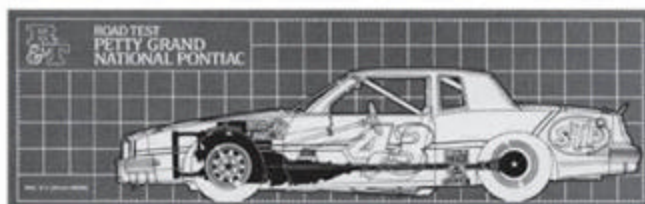
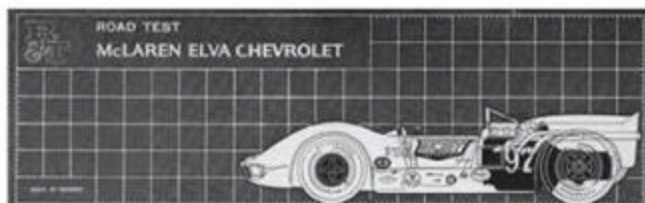
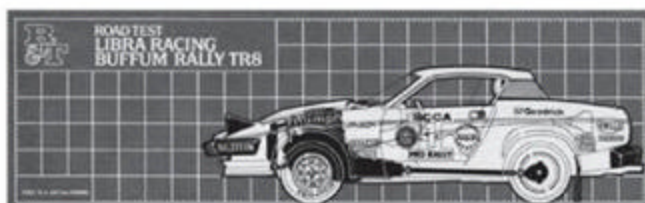
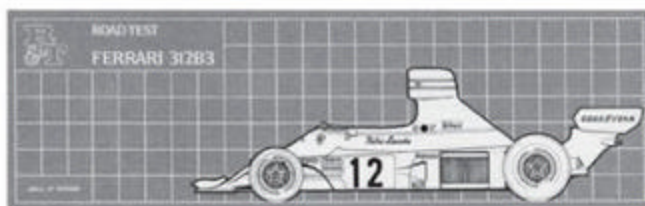


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MAKE & MODEL (ISSUE DATE)

	ENGINE TYPE	HORSEPOWER, SAE	TORQUE, LB-FT	CURB WEIGHT, LB	0-60 MPH, SEC	1/4-MILE, SEC @ MPH	TOP SPEED, MPH	BRAKING 60-0 MPH, FT	ROADHOLDING, G
Alfa Romeo 1750 GTV Trans Am (1/72)	I-4	205 ¹	-	2245	7.0	13.3 @ 92.0	121	275 ¹	-
Benetton-BMW B186 Formula 1 (3/87)	I-4t	900 786	1407 ²		3.0	9.4 @ 163.0	194	77	2.42
BMW 2002 Trans Am (1/72)	I-4	200	150	2440	7.2	14.4 @ 88.0	118	245 ¹	-
M3 GTR Grand-Am (5/02)	V-8	444	354	2425	3.3	11.3 @ 125.3	165	94	-
Cadillac Seville STSi Le Mans Pace Car ³ (7/00)	V-8	350	326	4050	6.3	14.8 @ 94.0	150 ²	128	0.82
Callaway Le Mans GT2 Race Car (12/95)	V-8	475	450	2760 ¹	3.7	11.6 @ 127.5	193	114	1.25
Chevrolet Corvette C5-R (6/01)	V-8	610	570	2650 ¹	3.5	10.3 @ 136.0	157	96	1.44
IROC Camaro (10/78)	V-8	450	396	3280	5.2	13.3 @ 110.5	152	282 ¹	-
Mike Keyser Monza IMSA (8/76)	V-8	536	440	2930 ²	4.7	12.1 @ 123.0	154	147	1.22
Datsun 510 Trans Am (1/72)	I-4	175 ¹	-	1982	7.0	15.2 @ 94.0	127	270 ¹	-
Electramotive/Devendorf 280ZX Racer (6/80)	I-6	270	202	2480 ²	5.7	14.1 @ 101.5	122	81	1.23
Sharp/Newman 280ZX Racer (6/80)	I-6	300	245	2315 ²	5.6	13.7 @ 104.5	124	121	1.23
Dodge Viper Competition Coupe (4/03)	V-10	520	540	2995 ¹	3.7	11.7 @ 122.9	182	97	1.15
Elva Formula Junior (6/60)	I-4	65	-	809	9.9	14.7 @ 68.5	100 ¹	-	-
Envoy Formula Junior (2/61)	I-4	79	65	794	8.8	15.5 @ 82.0	112	-	-
Ferrari 312B3 Formula 1 (5/76)	H-12	490	300 ¹	1315	2.4	9.0 @ 158.0	182 ²	258 ¹	-
333 SP IMSA (1/95)	V-12	650 ¹	330	1950 ¹	3.6	11.3 @ 133.0	185 ¹	105	-
365 GTB4 Competizione (11/74)	V-12	402	-	3380 ²	5.8	14.5 @ 107.5	166	145	0.95
Fiat Brava Abarth Rally (5/80)	I-4	230	166	2190	6.9	15.2 @ 92.0	113	172	-
Ford Kemp Cobra II IMSA (8/76)	V-8	570	530	2960 ²	4.1	12.1 @ 126.5	153	146	1.25 ¹
Trans-Am Mustang (1/71)	V-8	460	360	3240	5.5	12.9 @ 110.0	151	180 ¹	1.10
Huffaker Jensen-Healey (9/74)	I-4	196	155	2350 ²	7.2	15.1 @ 93.0	134	170	1.11
Jaguar D-type (5/56)	I-6	250	242	2460 ²	4.7	13.7 @ 107.0 ¹	162	-	-
R1 Formula 1 ³ (3/01)	V-10	800	-	1560 ²	2.7	9.4 @ 181.0	220¹	72	2.30
Lancia Montecarlo Group 5 Turbo (6/81)	I-4t	400	390 ¹	1720	3.6	11.3 @ 123.0	140	-	1.40 ¹
Mazda RX-7 Racer (11/79)	2-rt	270	166	2300 ²	5.3	14.1 @ 96.5	133	168	1.00 ¹
McLaren Elva Chevrolet (7/66)	V-8	466	445	2040 ²	4.1	12.0 @ 142.0	178	-	-
Panoz LMP-1 Roadster S ³ (4/02)	V-8	600	500	2135 ¹	2.3	9.3 @ 148.0	181	108	1.52
Pontiac Grand Prix NASCAR (4/82)	V-8	590	-	3810 ²	5.2	13.5 @ 115.0	183	121	-
Porsche 934 (1/77)	H-6	485	434	2965 ²	5.8	14.2 @ 121.0	163	105	1.30 ¹
935 (1/77)	H-6	590	434	2490 ²	3.3	8.9 @ 133.5	183	92	1.40 ¹
Quasar D Sports Racing SCCA (11/70)	I-4	88	58 ¹	820	9.4	15.3 @ 77.0	124	-	-
Renault Le Car Turbo IMSA (9/81)	I-4	260	220	1590 ²	4.8	13.3 @ 106.5	158	148	-
Riley & Scott Mk III-Olds WSC IMSA (3/97)	V-8	570	330	2150	3.1	10.9 @ 133.5	190 ¹	91	1.96
Swift DB-1 Formula Ford (3/84)	I-4	114	105	940	4.6	12.6 @ 110.0	116	84	1.28
Triumph Group 44 Tullius Racing TR8 (11/80)	V-8	360	310	2670 ²	4.3	12.7 @ 115.5	150	107	-
Group 44 Tullius Triumph TR7 (9/77)	I-4	175	146	2310 ²	6.9	15.5 @ 100.5	132	86	1.02
Libra Racing Buffum Rally TR8 (11/80)	V-8	280	245	2390	5.3	13.9 @ 103.5	107	117	-
Volkswagen Davey GT-3 Scirocco SCCA (7/81)	I-4	165	166	1950	6.7	15.1 @ 93.5	129	181	-

Motorsport Edition Legend: ¹from 80 mph, ²from 100 mph, ³test weight, "rt" designates rotor



LEGEND For **ENGINE TYPES**, I is an inline design; H is a horizontally opposed, or flat, design. V, VR, and W describe cylinder configurations; the number following the letter is the number of cylinders. An additional letter, a "t" or an "s," designates turbo- or supercharging; "tt" is twin turbo; "qt" is quad turbo; "d" designates diesel; "h" designates hybrid. "FC" designates fuel cell; "EV" designates an electric vehicle. **RED BOX** = leader in that category. ¹estimated; ²electronically limited; ³automatic/automated transmission. **ACCELERATION** is measured with one foot of rollout subtracted. **TOP SPEED** is typically as reported by the manufacturer, but we occasionally measure or estimate it. **BRAKING** distances are measured from the beginning of pedal depression to a complete stop. **ROADHOLDING** is the average cornering grip measured around a full skidpad lap in each direction. DATA APPLIES TO THE MODEL AT THE TIME (ISSUE DATE) OF TESTING. **R&T OFFICIAL TEST RESULTS ARE MARKED IN BLUE.**

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69111/62522/62573
Item 69052 shown

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60637/61615

Item 95275 shown

SAVE 55%

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**4" MAGNETIC
PARTS HOLDER**
PITTSBURGH

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90566/62535

Item 90566 shown

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TOOL CART**
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61634/61952
Item 95659 shown

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LOT NO. 68049/62326
61253/61282

Item 61253 shown

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• Weighs 77 lbs.

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60343
Item 67338 shown

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60533/69898

Item 37510 shown

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Item 42304 shown

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Item 60603 shown

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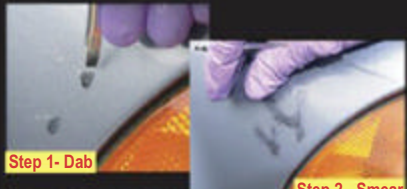
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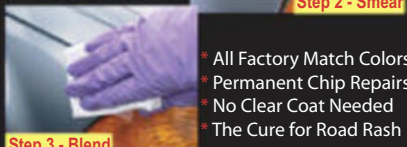
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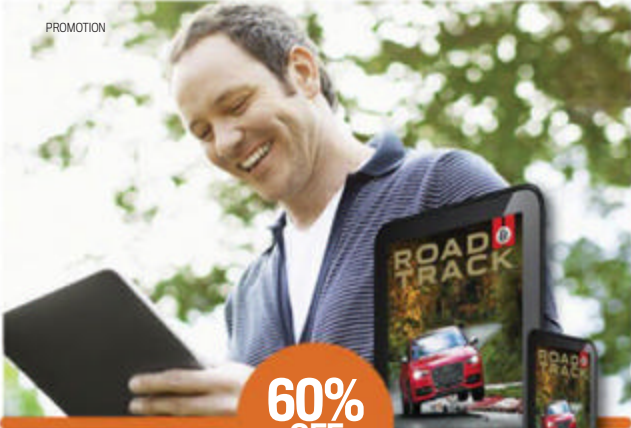
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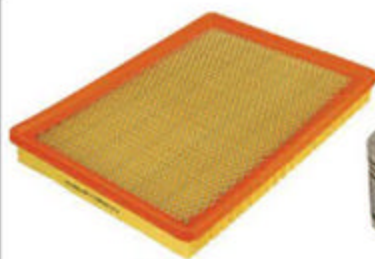
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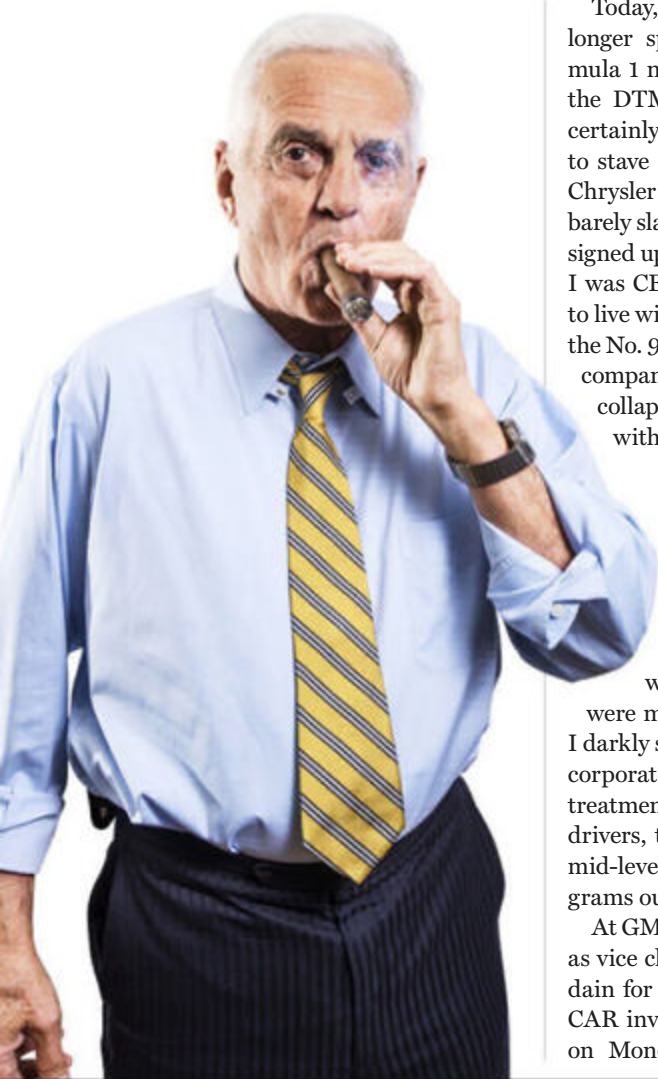
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The Racing Dilemma

MOTORSPORT SHOULD DRIVE TECHNOLOGY, NOT VIP EGOS.

GO LUTZ YOURSELF BY BOB LUTZ

Almost no subject triggers greater ambivalence in me than manufacturer-sponsored racing. I was a huge advocate decades ago, finding creative ways to circumvent the official GM worldwide racing ban and enter well-prepared Opel sedans and coupes in the Monte Carlo Rally and C3 Corvettes at Le Mans.



Today, as a manufacturer, I would no longer spend the money—not on Formula 1 nor any other open-wheel series, the DTM, any sedan series, and most certainly not on NASCAR. I was able to stave off the latter while president of Chrysler in the Nineties, but the door barely slammed behind me before Dodge signed up for a major sponsorship. When I was CEO of Exide Technologies, I had to live with a prior CEO's commitment to the No. 99 car, driven by Jeff Burton. The company was on the verge of financial collapse, and yet we were burdened with the enormous expense.

Mercedes, Ferrari, Maserati, and Lotus owe much of their image capital to successful racing.

The NASCAR engagement was fun, and Exide executives were made to feel important. Therein, I darkly suspect, lies some (not all) of the corporate support for racing: the VIP treatment—winning and dining, meeting drivers, touring the track—bestowed on mid-level executives who fund the programs out of their marketing budgets.

At GM, where I rounded out my career as vice chairman, I was vocal in my disdain for Pontiac's and Chevrolet's NASCAR involvement. "Win on Sunday, sell on Monday" certainly wasn't working

for the humble, pushrod V-6 Grand Prix sedans and Monte Carlo coupes. The parking lot of any major NASCAR race was filled with pickup trucks and RVs, but one looked in vain for Dodge, Ford, Pontiac, or Chevrolet cars. To compound matters, media coverage was always focused on the driver, not the marque.

On the other hand, racing, especially in its early days, provided the public with a visible demonstration of technical progress in areas such as aerodynamics, engine technology, brakes, and tires. This was particularly true when various technological approaches were allowed to compete against one another, as in post-World War II Formula 1, where manufacturers could opt for either 4.5-liter naturally aspirated (Talbot) or 1.5-liter supercharged engines (Alfa Romeo and Ferrari). There is no question Porsche achieved enormous fame and sales based entirely on motorsport, and Mercedes, Ferrari, Maserati, and Lotus owe much of their image capital to successful racing. But this all took place in an era when racing was truly competitive, many solutions were permitted, the cars were not nearly identical, and the emphasis was on winning technology, rather than feeding a spectator circus.

Return racing to its roots. Let each manufacturer choose whatever size, configuration, and powertrain it wants. The sole stipulation: the amount of fuel would be based on covering the distance at 20 mpg. Want to go small and lightweight? Choose a 750-cc turbo triple. How about partial battery range before letting 'er

rip? What an interesting and diverse field that would produce, and it would drive technology again.

Meanwhile, I see value in specialty brands like Corvette, Camaro, Mustang, and Porsche duking it out. Those owners care. Corvette would be a lesser car, in both technology and sale, without racing. In summary, I hate racing. And I love it. ■

The column's Q&A format will return next month. Bob Lutz has been The Man at several car companies, so your problems are cake. Bring 'em on.

JASON EHRHART,
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